Excavating Engineer

founded 1905

AUGUST
1955

50th ANNIVERSARY
1905-1955
Excavating Engineer

Here, foreground, crane with a rock grapple loads rock to a trailer in the Riverside (Calif.) quarry of the J. B. Stringfellow Co. In the background a wire rope sling is used on a shovel. The article begins on page 28.

New Model Bucyrus-Erie Walking Dragline

GOES TO WORK IN FLORIDA PHOSPHATE FIELDS

770-B

Electrically Driven with Ward Leonard Control

The first Bucyrus-Erie 770-B Walking Dragline was shipped recently to the phosphate fields near Bartow, Fla. It's the first installation of this particular model, but it's not a first for the stand-out features which forecast success for this newest member of the Bucyrus-Erie line. The 770-B will be at home on its multi-million yard assignment because of high output features such as these:

The dragline's all-welded boom, composed of T-section chord members with tubular bracing, combines maximum strength for carrying heavy payloads with minimum deadweight that keeps swing inertia and roller loads low. Excellent maneuvering ability is provided by the exclusive Bucyrus-Erie walking mechanism. Swing is accelerated and decelerated rapidly under Ward Leonard rotating control . . . digging and hoisting are fast, too, because both the drag and hoist drum units have their own individual motor drive.

These are only a few examples of the many 770-B features that mean outstanding performance in all stripping or other long range excavating operations requiring standard bucket sizes of 18 and 14 cu. yds. with corresponding boom lengths of 195 and 225 feet.

68L55C

BUCYRUS ERIE
South Milwaukee
Wisconsin

1880 75 1955
YEARS OF SERVICE
to Men Who
Shape the Earth

DART 20-S — 20 ton Truck being loaded by 5 yard shovel at quarry of Lone Star Cement Corp., Bonner Springs, Kansas.

DART *speeds production*

D-108

MORE CYCLES PER HOUR . . . those twin, double acting hoists dump the load fast and clean. Note the short wheelbase which helps make the DART 20-S so maneuverable in close quarters.

FAST . . . truck design that means more tons per hour. There's less waste motion, less time lost, with the DART 20-S. DART engineering has resulted in a truck with turning radius approximately the same as the average passenger car. That makes possible quick spotting at the shovel in tight quarters. Also, twin, single-stage double-acting hoists raise the body to maximum dump position in approximately 15 seconds. 225 HP Diesel with torque converter drive (which is optional) means faster starts and greater availability. All these factors add up to FASTER . . . more PROFITABLE . . . performance.

DART ENGINEERS CAN HELP YOU SOLVE YOUR HAULAGE PROBLEM.

DART TONNAGE ENGINEERED TRUCKS

Kansas City 8, Missouri

SUBSIDIARY OF THE CARLISLE CORPORATION

LET YOUR DART DEALER GIVE YOU PERFORMANCE FACTS ON DART OFF-HIGHWAY TRUCKS

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TORONTO, ONTARIO, CANADA—Federal Equip. Supplies, Ltd.
UTICA, N. Y.—Credle Equip., Inc.
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1105 takes Royal Blue out of the ordinary wire rope class.

1105 is a rope wire that's new—that's stronger. It's the biggest news in many years.

1105 is the result of more than a century of research and development—it's the wire that gives Roebling Royal Blue the stamina that pays off in service.

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Excavating Engineer

founded 1905

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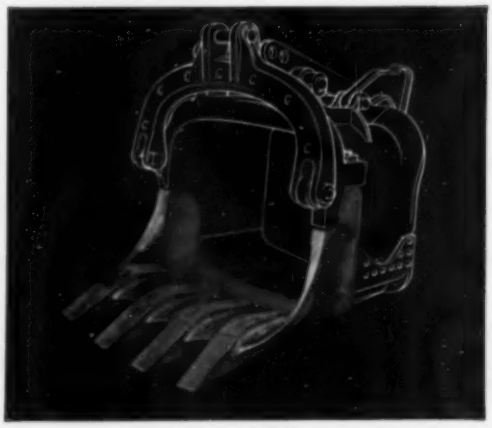
THIS AMSCO® LIP TAKES A SHARPER BITE

. . . chews out full loads at normal power

The lip juts way out where it easily bites up—and delivers—the full yardage of rock or earth. It's a sharp *extension* of the dipper, with fanned teeth—for fast, easy penetration. The dipper digs out a heavier load without strain on the shovel . . . even requires less power, and prolongs life of all parts.

This Amsco lip lasts a long, long time, because it's made of the toughest steel known—manganese steel—the metal that work-hardens to fight off wear by impact and abrasion. Lip replacement is simple, when necessary, keeping downtime short.

If getting more pay loads moved faster with less wear on equipment means more profits to you, *specify Amsco Renewable Lip Dippers.*



AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

Chicago Heights, Ill.

MODEL 41

LIKE ALL NORTHWESTS

It's a real 1 YD. ROCK SHOVEL

ALL Northwest Shovels are Rock Shovels and the Model 41 is no exception. The Model 41 is a *full 1 yd.* Rock Shovel—not "built up", not modified from another capacity, but built from the ground up as a full 1 yd. rig capable of the output and performance you expect from a 1 yd. Shovel.

Your Northwest Model 41 doesn't waste time! There's no stutter — no restarts — no dipper juggling either in the bank or getting the load in the truck. The cycle is fast and smooth. The "Feather-Touch" Clutch Control makes operation easy. The Northwest Dual Independent Crowd utilizes force most other independent crowd shovels waste. The Uniform Pressure Swing Clutches take hold smoothly—free from jerks and grabs—the dipper is up through the bank and over the truck in a hurry.

These are things that make big output figures!

Here is a machine it will pay to ask questions about. If you need a 1 yd. machine and want a real 1 yd. *built as a 1 yd.* ask a Northwest Man to give you complete details.

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UNLESS YOU OWN A NORTHWEST

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CRAWLER and TRUCK MOUNTED SHOVELS • CRANES • DRAGLINES • PULLSHOVELS

ANOTHER COMPLETELY NEW
PAYLOADER®
Biggest Yardage Producer In Its Class

COMPLETE Power-Shift Transmission

Makes ALL Shifts WITHOUT Stopping!

This "PAYLOADER" has a newly-developed power-shift transmission which is the easiest-operating, fastest-acting, most efficient ever put into a tractor-shovel. Shifting from *any* speed range to *any* other is accomplished instantaneously by fingertip action — *on the go* — there's no stopping, no "clutching". Directional shift (forward and reverse) is just as easy and just as fast. All speed ranges are provided in reverse as well as forward. Also included is a highly-efficient polyphase torque-converter that matches engine speed and torque to the load *instantly* and multiplies the engine torque up to 350%.

• with more digging power
• with faster operating cycles
• with easier, safer operation

YOU'VE never seen anything like this big new "PAYLOADER" — because there *is* nothing else like it. Nothing else like it in design — nothing like it in performance.

No other tractor-shovel gives you the tremendous digging power; the ability to get and keep heaped bucket loads under all conditions; the *complete* power-shift transmission which speeds operating cycles; the balance and stability to handle big loads fast, safe and easy.

If you want big, steady output — dependable performance hour after hour, put this husky HO on your jobs and you'll see the difference. Stop in at your nearest "PAYLOADER" Distributor and look it over.

HOUGH-DESIGN HOUGH-QUALITY

Safety and Stability. Special boom-arm shape and positioning keeps moving members out of operator's reach at all positions. Close, low, load-carry position and longer wheelbase provide stability and balance for fast maneuvering — with safety.

More Horsepower per bucket capacity than other standard models. Either gasoline or diesel power available.

Easy to Operate. Fullest operator visibility for safe, fast maneuvering; power steering; power-shift — no "clutching"; 4-wheel hydraulic brakes — vacuum boosted; foam rubber molded seat and back cushions; seat adjustable for operator comfort; longer wheelbase adds to rider comfort.

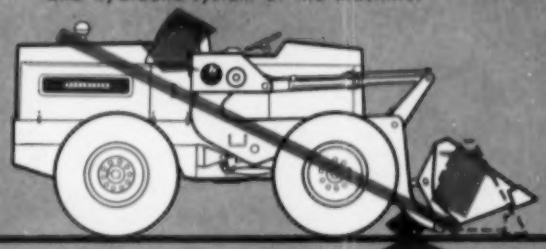
Superior Hydraulic System. Sealed, pressure-controlled hydraulic system to keep dirt and air out of oil; double-acting, long-life hydraulic rams with chrome-plated piston rods, and highest quality oil lines and fittings.

Fully-Equipped. Standard equipment includes: built-in headlights, back-up lights and tail lights; 12 volt electrical system for gas-powered units.

Extra Equipment for Greater Usefulness. Bulldozer blade, special buckets, bucket teeth, crane hook and lift fork attachments; snow plows, backhoes and many other useful and special accessories will be available.

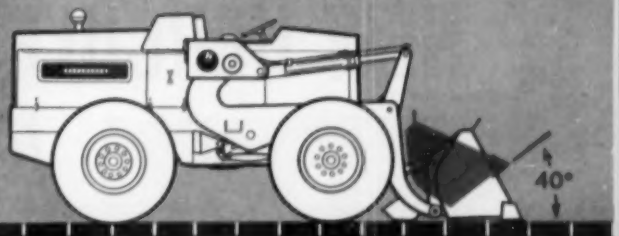
POWERFUL PRY-OUT ACTION

Tremendous pry-out force is obtained by using the breakout pads on the ground as a fulcrum for leverage. The load forces opposing the pry-out action are thus transferred to the ground through the pads instead of to the axle, wheels and hydraulic system of the machine.



40° BREAK-OUT AT GROUND LEVEL

You can get HEAPED BUCKET LOADS and you get them FASTER and EASIER WITH THIS NEW BUCKET ACTION. Most important of all — you KEEP BIGGER PAYLOADS — because the bucket can be tipped back a full 40 degrees at ground level before it is raised, eliminating spillage.



THE FRANK G. HOUGH CO.
709 Sunnyside Ave., Libertyville, Ill.

Send full information on the new Model HO, 2-cu. yd. "PAYLOADER"

NAME .....

TITLE .....

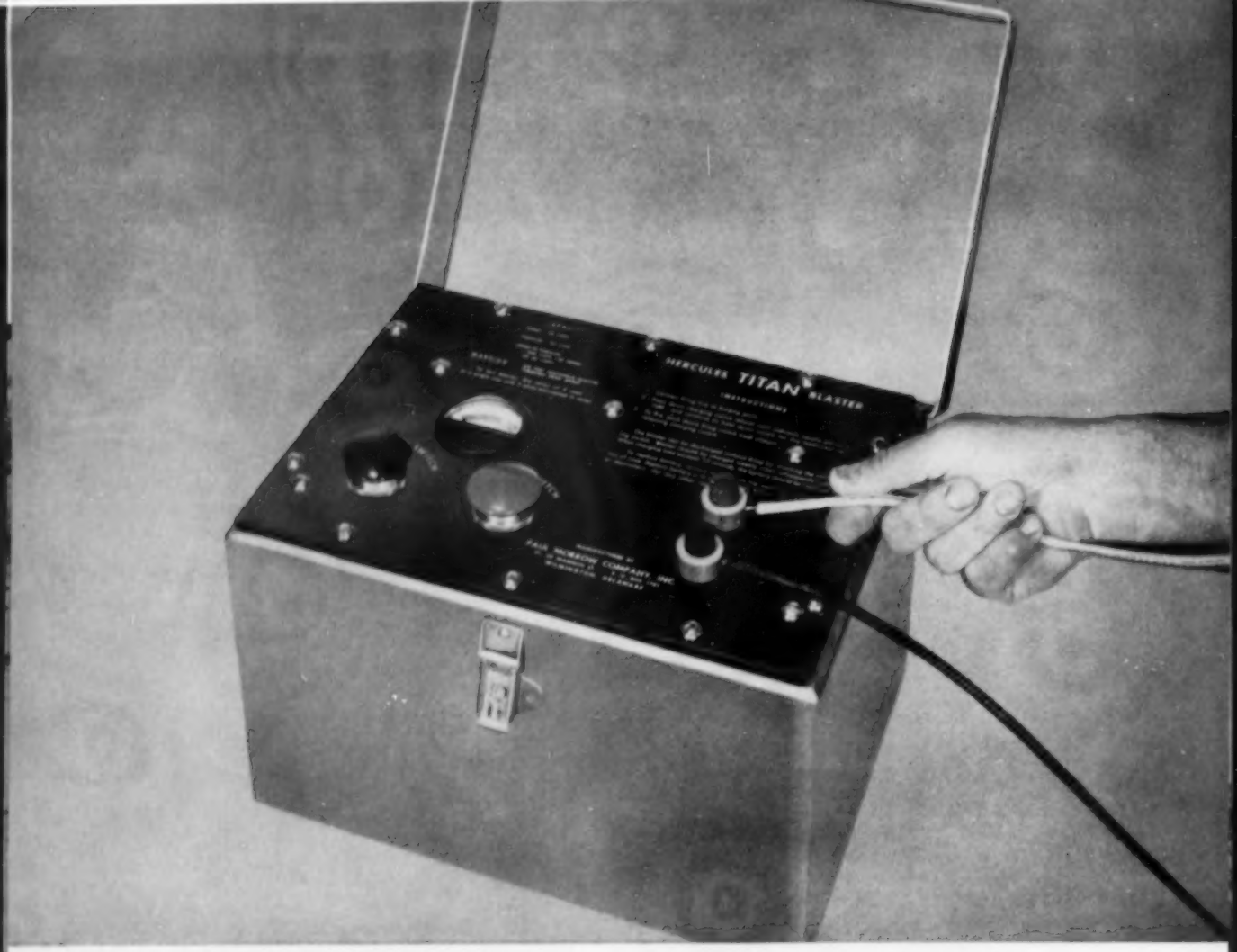
COMPANY .....

STREET .....

CITY .....

STATE .....

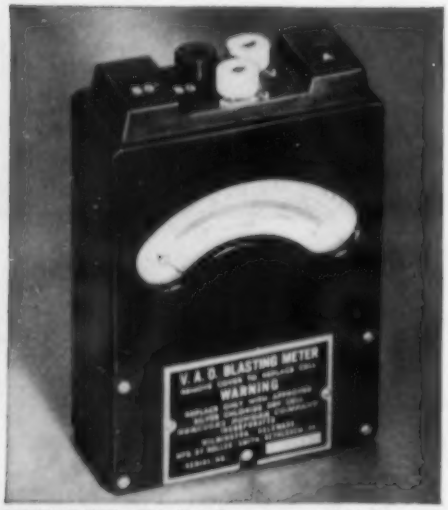
PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



HIGH CAPACITY, YET PORTABLE—The Titan Blaster is housed in a rugged aluminum case and is waterproof.

NEW HERCULES TITAN BLASTER

For Maximum Safety, Economy



THREE-IN-ONE—The V.A.O. meter, available through Hercules, is a combination voltmeter, ammeter, and blasting galvanometer that has proved its value in field use as an important blasting aid.

The Hercules Titan® Blaster is a high-capacity, condenser discharge type of blaster that combines maximum safety with minimum maintenance expense.

The Titan Blaster has no moving parts. It is operated by depressing two push-button switches—one to charge and one to fire. This new Hercules blaster develops sufficient electrical energy to fire as many as 1,200 detonators. Yet, there is no high voltage associated with the Titan Blaster except during charge and firing. The source of energy is a relatively inexpensive 6 volt, dry cell ignition-type battery.

For full technical details on the Titan Blaster, write:

HERCULES POWDER COMPANY
INCORPORATED
Explosives Department, 972 King St., Wilmington 99, Del.

1855-7

19 mph tractor handles all cleanup on 4½-mile section of Ohio Turnpike

To grade a 4½-mile section of the Ohio Turnpike south of Sandusky, D. R. Smalley & Sons of Celina had to move 1,300,000 cubic yards of black dirt, silted sand, and clay.

While most of the production dirtmoving was assigned to a conveyor-type loader working with a fleet of bottom-dumps, contractor's mobile Tournatractor proved invaluable for fast handling of scattered dozing and miscellaneous tractor jobs.

Cleans spillage around loader

Most important project for the Tournatractor was cleaning overflow and spillage in the cut. By moving quickly around loader, pulling-and-pushing tractors, and haul units, it did this work without interruption to the loading cycle. In spare time, Tournatractor made good use of 19 mph travel speeds by driving all over the project to handle a wide variety of "hit-and-run" dozing and towing assignments.

Whenever one of the bottom-dumps got stuck in soft footing or climbing upgrade, Tournatractor came to the rescue... pushed hauler up the slope or through muddy spots... then hurried back to its regular job at the loader. On other occasions, unit spread fill... graded slopes and did other dozing... and towed a LeTourneau-Westinghouse sheepsfoot roller.

Does work of several crawlers

To handle the same scattered assignments completed by this one Tournatractor, company officials say several crawlers would have been needed.

"Tournatractor can really get around," is the way Supt. George M. Smalley describes Tournatractor mobility.

Operator H. K. Castal agrees, "I like the maneuverability of the Tournatractor. It's easy to operate, too!"

Consider these 3 advantages!

No matter what size equipment fleet you have, no matter whether you move dirt with scrapers or trucks — or both — you'll want to investigate these major Tournatractor advantages!

1. Tournatractor's fast forward speed, instant gear changes and 8 mph reverse enable it to do twice as much work as a crawler-tractor on most jobs.
2. Tournatractor reduces travel time between jobs by driving anywhere under its own power at speeds up to 19 mph.
3. Its four single-wheel units, with power traveling on sealed anti-frictions, require much less maintenance than crawlers with their 450 to 550 moving parts.

Why not see and judge for yourself? Let us demonstrate Tournatractor's abilities on your job. Call or write us to arrange time and place.

Tournatractor—Trademark T-717-H-b

▲ Driving job-to-job at speeds to 19 mph, Tournatractor's low-pressure tires absorb most of the jolts of cross-country travel. Says Operator H. K. Castal, "Tournatractor rides nicer than a crawler. You don't get the old jar!"

Tournatractor helps bottom-dump up grade. Tractor's 208 hp diesel, big 21.00 x 25 low-pressure tires, and 4-wheel drive combine to provide plenty of pushing power. ▶

LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

This Torcon-equipped dragline gets more work by the bucket with less work by the engine.

Self-contained oil circuit keeps TORCON efficiency high

This simple design feature is a big factor in keeping TORCON efficiency consistently high: the oil sump is an integral part of the housing—no complicated oil seals to lessen efficiency and complicate maintenance. Oil passages are cored in the housing—no extra hoses and fittings.

Easy accessibility is valuable, too. Simply remove two cover-plates, and the whole unit is fully exposed for inspection and service—no special tools needed.

The Clark-Torcon is a complete unit, mass-produced, available off-the-shelf to engine and original equipment manufacturers, and to owners and operators. It's the broadest line available to industry, with a wide range of wheel diameters and a complete choice of options, for easy fitting into any torque-transmission system.

There's a Torcon to FIT YOUR NEED

This fully illustrated, easy-to-read bulletin explains torque multiplication clearly; and indicates its many industrial applications. Use the coupon to get your copy.

A Complete Quality Line—Clark-Torcon

All Sizes—from 15 to 600 H.P.

Broad Range of Options—readily adaptable to many applications

No Cavitation—proper oil flow prevents turbulence and formation of air pockets to cause wear and loss of efficiency

High Efficiency over wide range—more work done, and reduced wear on components

Individually Cast One-Piece Elements—no welds or fabrications to distort under extreme loads

SCHNEIDER SYSTEM

CLARK EQUIPMENT

CLARK EQUIPMENT COMPANY, Jackson 5, Michigan: Please send the CLARK-TORCON Bulletin

Name_____ Position_____

Firm_____ Address_____

City_____ Zone_____ State_____

Above Rear-Dump handles 53% of limestone haul for Allegheny Mineral Corp.

The LeTourneau-Westinghouse machines you see here — a 186 hp Tournatractor and an 18-ton Rear-Dump—have been used by Allegheny Mineral Corporation, Cowansville, Pennsylvania, since the summer of 1953 both for stripping and for hauling shot limestone. Units work alternately at Allegheny's pits in Parker's Landing and Kittanning. They make trips between the two places under their own power. The Rear-Dump drives the 35 miles through traffic in about an hour; Tournatractor makes the trip in about two hours. Fingertip electric power steer and 4-wheel air brakes (more braking surface on 1 wheel than most units have on all 4) make for safe high-speed travel.

Above Rear-Dump is being loaded by a 1½-yd. shovel. Loads in the shot limestone usually weigh out at around 19 tons each. Note simplicity of the Rear-Dump body design. Unit has no frame, no sub-frame, no springs or spring hangers, no front steering wheels, no hydraulics . . . hence seldom needs repairs.

Low entry from rear, plus big 9½' x 12' target, speed loading . . . reduce spillage. Triple-layered all-steel body absorbs shocks of heavy, sharply-fragmented rock. High all-steel front guard protects driver, controls. Capacity of this Rear-Dump, without sideboards, is 18 tons. Other models carry 9, 35, and 50 tons.

Hauling shot limestone 4/10 mile from pit to crusher, Rear-Dump reaches 15 mph speeds, despite narrow roads, short sections of 10 to 15% grades and several sharp curves. Tires give adequate traction even on snow and ice. Material being hauled will be crushed into agricultural limestone and road-surfacing.

Waste material is dumped about half a mile from the shovel. Company records show Rear-Dump averages 34 loads per 8-hour shift — as much as the shovel can load. Note how body swings below and behind rear wheels. This keeps material from piling under unit, also allows safe dump over steep banks.

Spoil dumped by the LeTourneau-Westinghouse Rear-Dump and another hauler is leveled by Tournatractor. Other duties for this 19 mph tractor include leveling and maintaining limestone aggregate stockpiles, pulling a 15-yd. scraper to self-load and strip dirt and rock, and pulling a ripper to loosen rocky material.

Tournatractor blade carries 2½ cu. yds. per push. Electric-control down-pressure provides smooth cut. Tires roll without damage over abrasive footing which badly damages crawler tracks. Says Co-Owner C. H. Snyder, "LeTourneau-Westinghouse units just fit our layout. Their maintenance is low and production high."

Tournatractor—Trademark TR-662-Q-b

For more information on either Rear-Dump or Tournatractor, please write or call:

LeTourneau-WESTINGHOUSE Company

Peoria, Illinois

A Subsidiary of Westinghouse Air Brake Company

matched to the job—

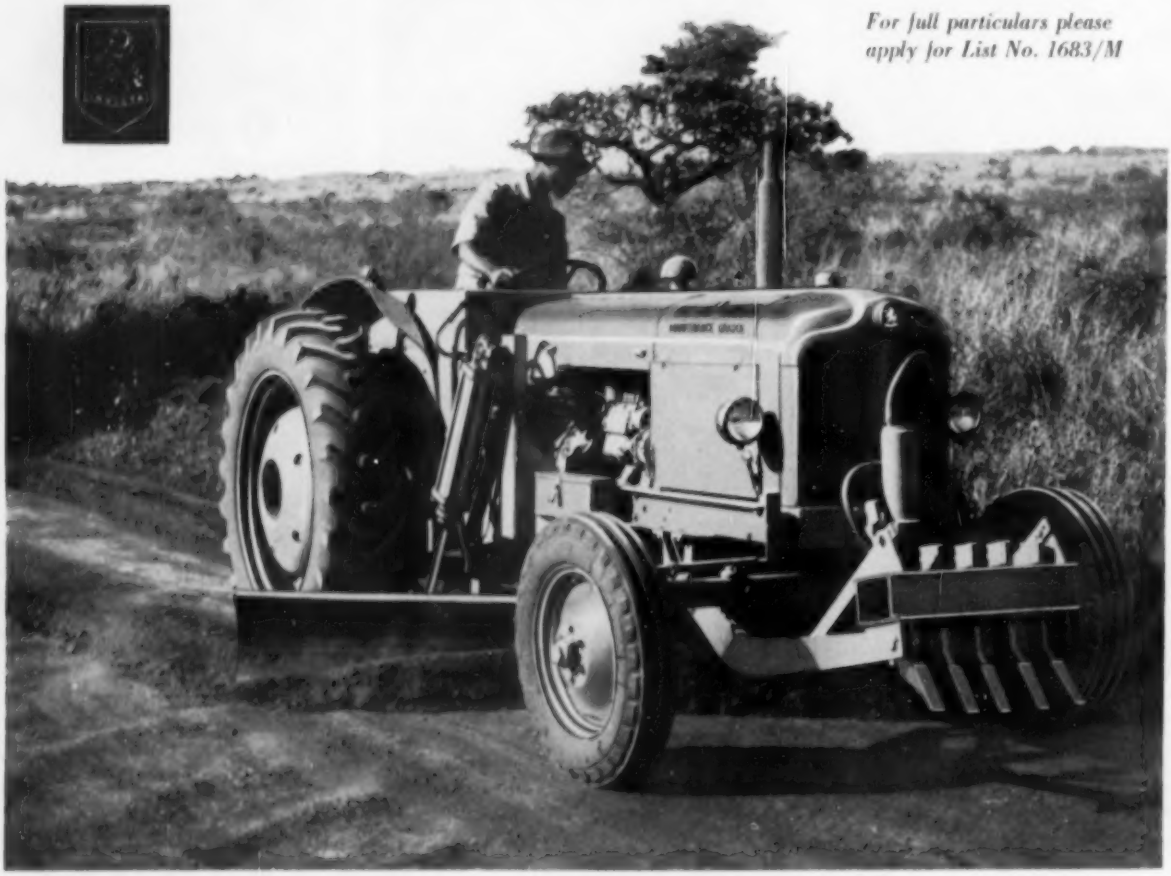
With its rugged construction and 42½ H.P. Diesel Engine, the Aveling-Barford Maintenance Grader can handle all the smaller jobs which are unprofitable for a larger machine.

Reliable and versatile, its range of attachments including bulldozer blade, scarifier and snowplough widens its scope and usefulness.

So when you need an economical, easy-to-handle low-cost grader that has year-round application, you cannot do better than invest in the job-proven Aveling-Barford Maintenance Grader.

AVELING-BARFORD MAINTENANCE GRADER

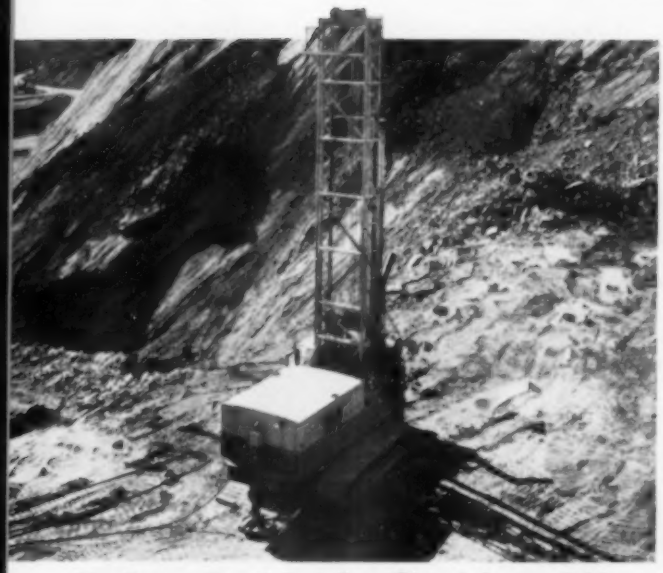
For full particulars please apply for List No. 1683/M



AVELING-BARFORD LIMITED GRANTHAM ENGLAND

P1621

How Bucyrus-Erie Operating Control Boosts Hole Production

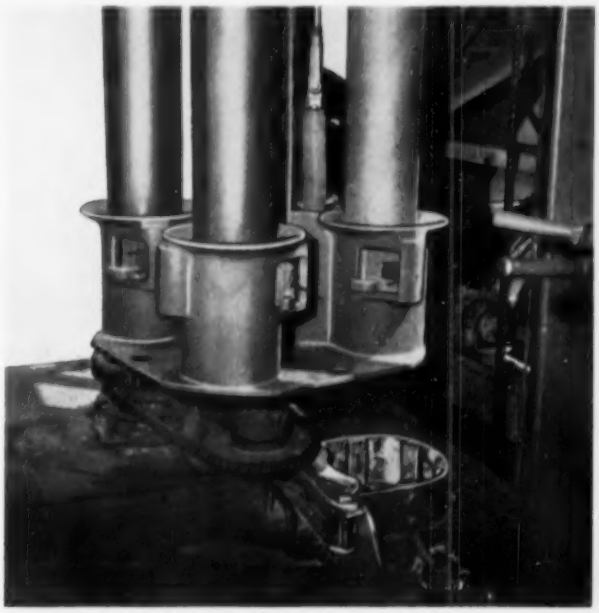


This Bucyrus-Erie 50-R, drilling 9⅞-in. holes in a California limestone quarry, saved 19 cents per foot of hole drilled during a four-month comparison period with other drilling equipment.

Flexibility in Feed and Rotation

Ability to drill any formation efficiently is provided by this Bucyrus-Erie exclusive combination of features: Ward Leonard electric control of drill rotation speed and hydraulic motor control of pulldown. Through Ward Leonard control, the operator can choose the most efficient speed for a given formation — can accelerate or decelerate as required without stopping the drilling operation. In hard formations, maximum pulldown may be exerted on the bit while the drill pipe is turning slowly. In soft material, rotating speed can be increased substantially as down pressure is automatically reduced.

Spectacular footage records set by Bucyrus-Erie rotaries have made them the world's most talked about blast hole drills. Since their introduction to pits and quarries a few years ago, they have established new standards of efficiency and production. One reason why they maintain a steady pace — hole after hole, move after move — is that Bucyrus-Erie design puts every drilling operation under practically push-button control.



Quick Tool Changing

A remote-controlled, power driven tool handling unit moves drill pipes from storage rack to the drill hole. Pipe sections may be added as needed without any heavy manual effort. The complete length of each section may be drilled down in one continuous run, because both rotary drive and pulldown force are applied at top of the drill pipe. After completion of each hole, the drill pipes are withdrawn, dismantled, and stored away, all under power.

Let us tell you more about the rotary blast hole drills that can cut your drilling costs. Bucyrus-Erie Model 50-R drills 9⅞- to 12¼-in. holes, is offered with electric drive. Model 40-R drills 6¾- to 9-in. holes, is available with either diesel-electric or full electric power. Write for detailed specifications and illustrated literature. 29B55C

BUCYRUS ERIE
South Milwaukee Wisconsin

1880 75 1955
YEARS OF SERVICE
to Men Who Shape the Earth

Biggest tractor news in years...

Unequalled Power...Smoother Operation...

Here's a completely new concept of crawler tractor design and performance . . . the new TC-12 Twin-Power Euclid. It's designed and built to give you all the features you want in a tractor—more power, easy operation, greater workability and accessibility for servicing . . . and all of the power train components are matched, with years of application in earth moving equipment.

Powered by two diesels with separate Torqmatic Drives for each track, the TC-12 has 365 h.p. available for tractive effort — a smooth steady flow of power to meet any job requirement. There's no master clutch and no manual gear shifting . . . the operator simply moves a lever to select one of three speed ranges — forward and reverse — for travel speeds up to 8.3 m.p.h. Maximum drawbar pull is equal to, or greater than, the weight of the tractor and any attachments.

Each half of the tractor is separate and free to oscillate on a single transverse shaft. This gives the TC-12 maximum stability and traction on rough ground. The tractor can be easily separated into two halves for shipment when necessary.

✻ See Euclid's complete line at General Motors POWERAMA—the World's Fair of Power—Soldier Field Chicago, Illinois, August 31 through September 25.

Never before so much WORKABILITY!

the "Euc" TC-12 Twin Crawler

INDEPENDENT TRACK DRIVES

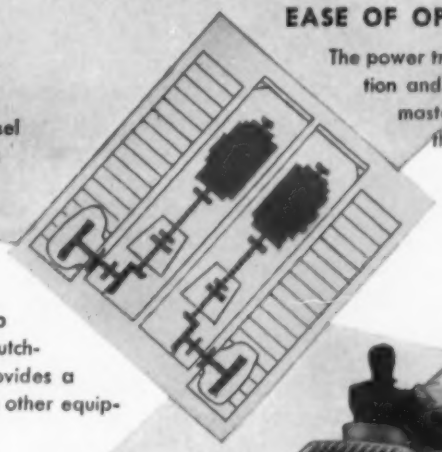
"Hair trigger" control of steering at all times and in any speed range, forward or reverse, is a result of each track having a separate power train. Spin turns, fast and tight, can be made by reversing one track and keeping the other in forward speed. Routine steering is done easily by putting one transmission lever into neutral and using the track brake. Fast, easy steering is one of the outstanding design and performance features of the "Euc" TC-12.

TWIN ENGINES

With 365 h.p. delivered to the power train, the TC-12 has far more horsepower than any other "big" tractor . . . and the weight to use this power as tractive effort. It develops greater drawbar pull at faster travel speeds . . . a mighty important feature for work with rubber tired scrapers and other crawler applications. A top travel speed of 8.3 m.p.h. and faster speeds in the working ranges give the TC-12 a big advantage in workability.

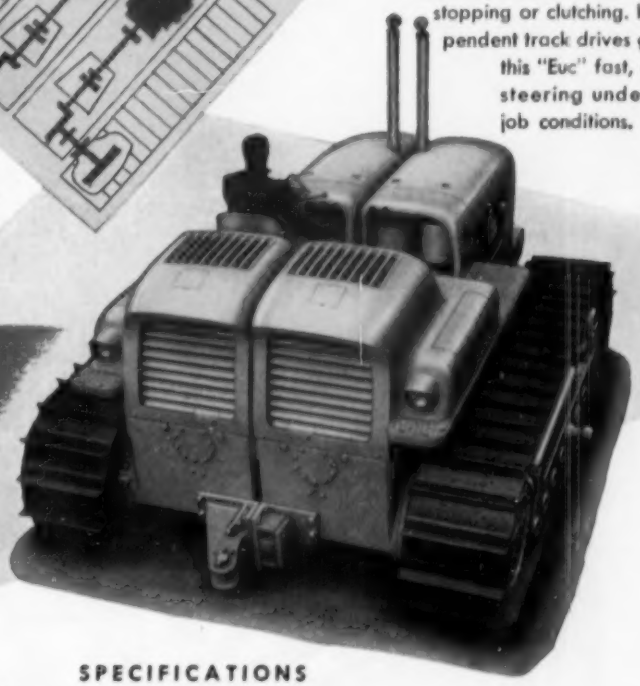
TORQMATIC DRIVES

Each track is driven by a GM 6-71 diesel through a separate Allison Torqmatic converter and transmission. Shifting from one of the three speed ranges to another can be done under full power with no loss of motion . . . the tractor can be shifted into reverse while moving forward so there's no lost time for stopping and clutching. The power train of the TC-12 provides a steady flow of power that's matched to other equipment and job requirements.



EASE OF OPERATION

The power train of the TC-12 provides simple operation and a smooth flow of power. There is no master clutch . . . shifting from one of the three speed ranges to another is done under full power with no loss of momentum. There's no delay for stopping or clutching. Independent track drives gives this "Euc" fast, easy steering under all job conditions.



More Workability

RADIATORS AT REAR

Rear location of the cooling system maintains efficient engine operating temperatures and provides better front visibility for the operator. Hinged radiator hoods make it a simple matter to change a fan belt or to service the radiator.

ACCESSIBILITY

Unitized assemblies are all easy to get at—they can be removed or serviced without tearing down other parts. Accessibility of all major components that can't be equalled in any other crawler—keeps downtime to a minimum. All lubrication fittings and check points are located for easy servicing—fuel tanks have ample capacity for full shift operation.

SPECIFICATIONS

total h.p.—388 h.p. at rated speed
available for tractive effort—365 h.p.
speeds—3 speed ranges forward and reverse to 8.3 mph
drawbar pull (bare tractor)—forward and reverse—
54,000 lbs. low range
53,500 lbs. intermediate
53,000 lbs. high range

track width (standard shoe)	26"	track gauge	110"
overall width	11' 4"	overall length	16' 2"
height (excluding stacks)	7' 11"	drawbar height	23"
ground clearance	20"	operating weight (bare)	approx. 58,000 lbs.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

GM GENERAL MOTORS

MORE PULL WITH LESS FUEL!

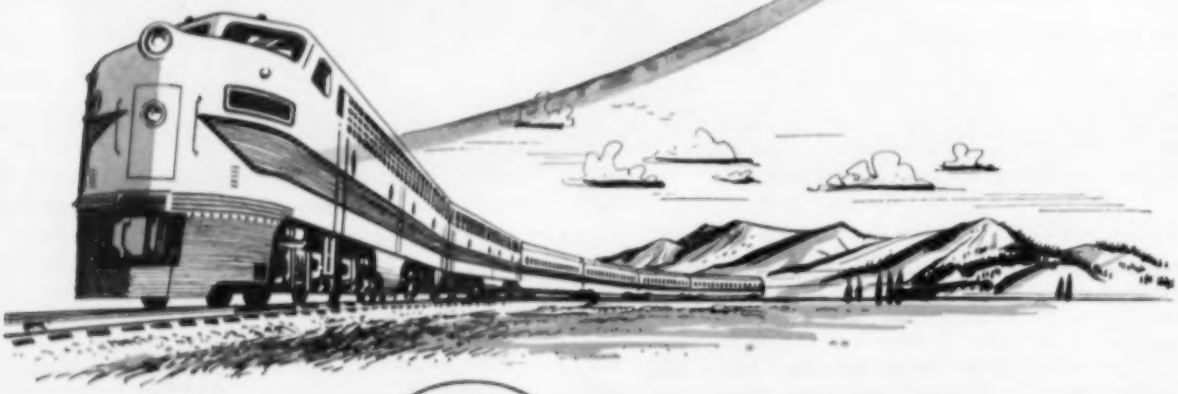
AiResearch Turbochargers provide rapid response to acceleration demands . . . end objectionable smoking!

Consider what the application of AiResearch Turbochargers to diesel locomotives will accomplish: A team of these small power packages will provide a greater increase in power at smaller cost in space and weight than any comparable turbocharger or supercharger installation.

In addition, specific fuel consumption on a horsepower per hour basis will be far less. Sea level performance will be restored within operating limits at altitude, response to acceleration demands will be rapid and excessive smoking under operating power eliminated. Also, the noise level will be greatly reduced.

Application in other fields will be equally effective, as has already been demonstrated in the remarkable results achieved by the installation of AiResearch Turbochargers on Caterpillar diesel machinery.

AiResearch is the largest producer of small turbomachinery in the United States, with twenty-five *million* hours of experience. This unmatched experience explains why AiResearch Turbochargers lead in power, economy and dependability. Your inquiries are invited.



THE GARRETT CORPORATION

AiResearch Industrial Division

9225 Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND RELATED MACHINERY

Now...

from Caterpillar

...a major

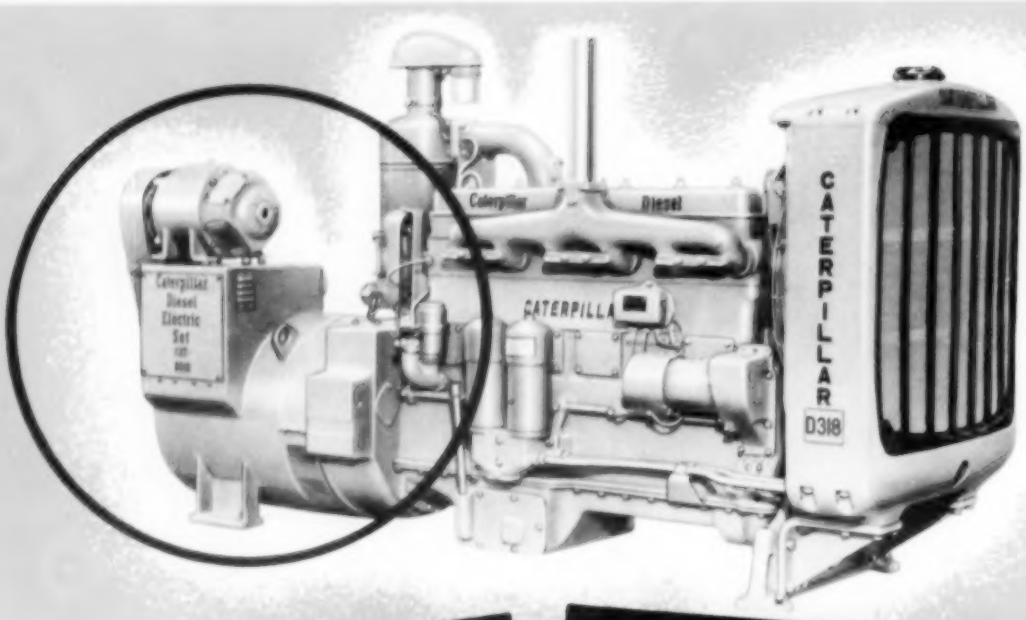
development

in

MODERN ELECTRIC POWER

The new

CATERPILLAR

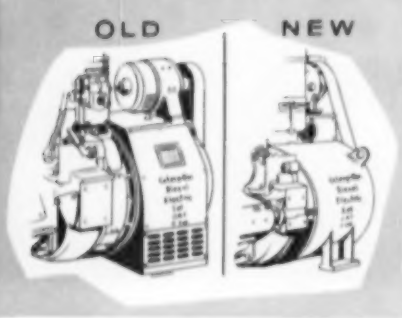


Nothing like it for simple operation, flexible application, compact power, rugged construction, long life and ease of maintenance.

Heart of the new line of Cat Diesel Electric Sets, providing in one package the best features of self-regulated and externally-regulated generator plants—you get more for your money.

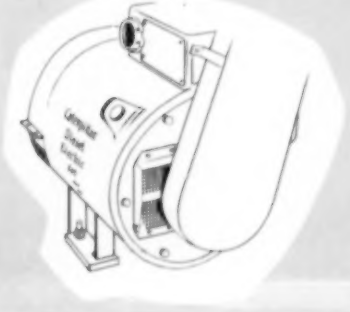
Easily paralleled with other generators now in use.

There is a big difference in size between the old and new Caterpillar Generators.



New insulation permits more compact design—exaggerated comparison in illustration below.

New design saves space. Leads can be taken from side, back or top without affecting machine width.



GENERATOR

Here is a new concept in generators – an advance that stems both from Caterpillar research and practical experience in the field of electric power.

Combining latest developments in design, materials and production, it brings to Caterpillar's new line of Diesel Electric Sets the efficiency of the externally-regulated set in a self-regulated set–you get more for your money.

These rugged power packages provide you with many new advantages. Here are a few of many features that add up to a new standard of efficient, economical performance:

- **Close regulation of voltage—no load to full load.**
- **Easy to start—require no operating adjustments. Anyone can run them.**
- **Extremely compact—big electrically, packing more power in smaller space than old style units.**
- **Easily paralleled with other generators now in use.**
- **Like all Caterpillar-built equipment—100% backed by Caterpillar.**
- **Sold and serviced by one reliable source—your nearby Caterpillar Dealer.**

Whatever your power requirements, it will pay you to look into the new Cat Diesel Electric Sets with their advance-design generators. Get the full facts about them from your Caterpillar Dealer.

MAJOR ADVANTAGES OF THE NEW CAT GENERATORS

1 **MATCHED TO ENGINE PERFORMANCE.** Each Cat Generator is designed and built to exactly match the Cat Engine powering it, assuring maximum efficiency in a simple, complete package.

2 **SELF-REGULATING, WITH CLOSE VOLTAGE REGULATION.** Designed to meet the needs of applications now served by self-regulated or externally-regulated generators, this new generator provides steady voltage from no load to full load.

3 **ADJUSTABLE FOR SPECIAL CONDITIONS.** During initial installation, the terminal voltage and voltage "droop" can be adjusted to meet the special conditions of the application. After that, the adjustments are locked and no further adjustments are necessary.

4 **EASY TO INSTALL.** No complicated switchgear or external voltage regulators are needed.

5 **VERSATILE IN APPLICATION.** Easily paralleled with other generators now in use.

6 **SMALL AND COMPACT.** Occupy less space than other generators. A reduction in frame size, close coupling, top-mounted exciter results in a shorter over-all package length.

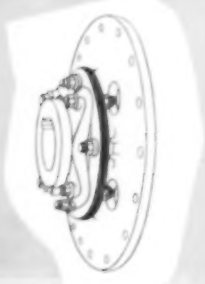
7 **BIG ELECTRICALLY.** Motor starting ability — capacity to handle the surge of heavy loads.

8 **EASY TO MAINTAIN.** Heavy-duty, single-bearing, close-coupled construction. The single bearing is easily accessible and is lubricated from an oil reservoir that requires filling only once a year.

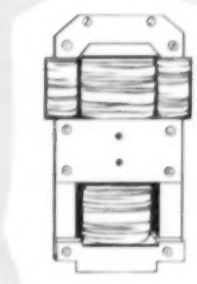
9 **RUGGEDLY CONSTRUCTED.** Heavy-duty, laminated pole rotor for improved operation and increased rotor life.

10 **DESIGNED FOR LONG LIFE.** Built to match the long life of the Caterpillar Engine powering them.

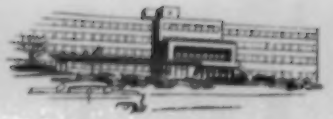
Disc-type coupling and single-bearing design save space. Single bearing is easily accessible.



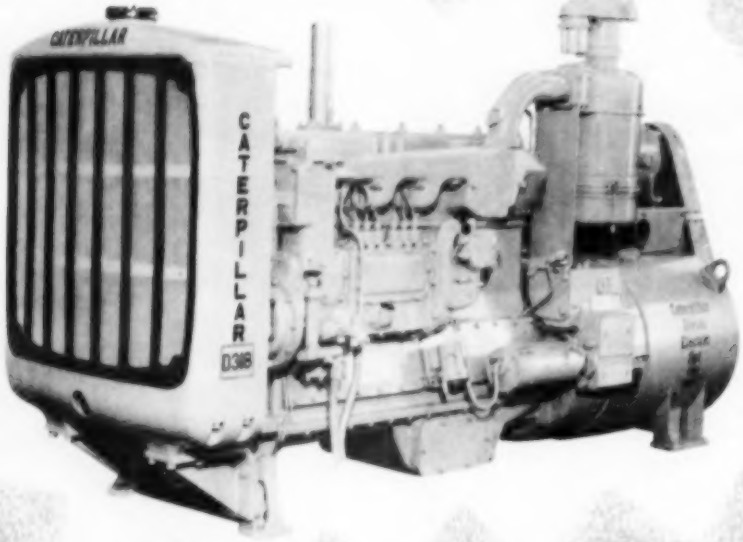
The "regulator" of the Caterpillar Generator. No moving parts — compact — reliable.



The control panel—adjustments locked at installation. No further attention required.



The new CAT* Generator



. . . another example of Caterpillar leadership in action

In 1939, Caterpillar introduced the first Cat self-regulated Electric Set.

At the time, this was a new concept in diesel-electric power.

Like most new developments, it had to win acceptance against "old, hidebound, traditional prejudices and practices."

It won acceptance — quickly and with outstanding success!

Just look at the record: since 1939, thousands of Cat Electric Sets have delivered long, reliable, economical service in widely different applications in every corner of the world. Sets with many thousands of hours of profitable operation are not uncommon. Many with more than 100,000 hours on their meters are still in use and going strong.

No matter how old they grow, not a single one ever becomes a "parts orphan." Like every Caterpillar-built machine, genuine Cat parts will be available as long as you have a need for them.

Now Caterpillar introduces another new concept in diesel-electric power—a new and better generator, heart of the new line of Caterpillar Diesel Electric Sets.

Like that 1939 "new concept of diesel-electric power," this is also backed 100%.

New design, new materials and new production techniques have made it possible for you to get more for your money in the new power packages.

See your Caterpillar Dealer about the new line today!

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

MAIL TODAY!

CATERPILLAR TRACTOR CO., Peoria, Illinois, U. S. A.

I'd like more information on the new Cat Generator.

Name _____

Company _____

Address _____

City _____ Zone _____ State _____

CATERPILLAR*

*Cat and Caterpillar are Registered Trademarks of Caterpillar Tractor Co., U. S. A.

NEW HEAVY-DUTY ELECTRIC SETS

PRINTED IN U. S. A.

How a 5½ yard shovel, spotted on narrow benches, digs and trims a 284′ deep highway cut

Manitowoc 4500 excavates 600 yards per hour for Bruns Coal Company of Zanesville, Ohio, on highway widening job at Steubenville, Ohio

The Manitowoc Model 4500 will move most of nine hundred thousand yards of material to be excavated during the widening and modernization of 1.823 miles of Ohio State Highway #7 . . . Jefferson County, Ohio. Bruns Coal Company is working their 5½ Yd. rig two 8-hour shifts per day, digging through alternate layers of slate rock, coal seams, slate clay, flint clay and boulders. Blasting ahead of the machine cannot be uniform because of the layered quality of the soil, yet the Manitowoc digs as much as 600 yards per hour.

Bruns uses six 15 Yd. Euclid hauling units moving spoil from the big cut. The narrow benches are so cramped that the shovel must swing out over the lip of the cut when loading. The Manitowoc has a ground bearing pressure of only 9.6 pounds per square inch . . . (less than most one-yard machines)—and is exceptionally compact for a big machine (tailswing radius 19′4″). These factors plus the elevated pilot house (operator's eye level—15′) warrant record yardages without interruption of highway traffic directly below.

Another Manitowoc feature, the tubular dipper stick, has proven its worth in this excavation where the dipper encounters boulder, coal, slate, and clay during one digging cycle. Twisting, uneven digging forces only dip the dipper slightly and transmit no strain to the boom or shipper shaft, yet lift of the hoist rope maintains an upright dipper position and digging shocks are absorbed without the damage which might necessitate excessive maintenance in any other rig.

Besides the drill rig and hauling units, the Manitowoc is the only other machine on this cut. *Controlled Power* . . . Single diesel engine with a torque converter power take-off gives ample flexible power and speed. 52″ drum brakes and 49″ clutches, are air operated for the smooth, precise control necessary to cut, trim and finish this 284′ deep 1-to-1 slope!

Modern highway construction hinges on the ability and capacity of larger, more efficient equipment. More and more contractors are using Manitowoc Model 4500's for roadwork because of record capacity and extreme mobility. Bid your next job on the basis of a Manitowoc.

Manitowoc Engineering Corp., Manitowoc, Wis.

. . . working in close quarters, Manitowoc hangs over the highway, where traffic continues without stop.

DIESEL AND
GASOLINE ENGINE OPERATORS
A NEW
PM TOOL

ADC* Oilprint Analysis

CHECKS CRANKCASE OIL IN MINUTES

Shell Research gives you new oil-change yardstick—

Now—operators can test crankcase oil in the short time allotted for refueling and crankcase oil checks. The Shell ADC Oilprint Analysis gives a practical and accurate oil evaluation in minutes.

ADC Oilprint Analysis means big savings when used in your preventive maintenance program . . . gives valuable information on engine and oil conditions. It answers the question "When do I change my oil?" thus eliminating the draining of usable oil and the risk of using oils loaded with contaminants.

See for yourself how the new Shell ADC Oilprint Analysis can save you money in preventive maintenance. Let us show how you can use this new service for your equipment.

SAVES... Time, Money, Engines, Oil

*Trademark

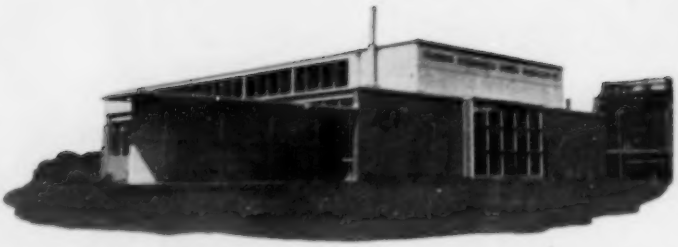
SHELL OIL COMPANY,

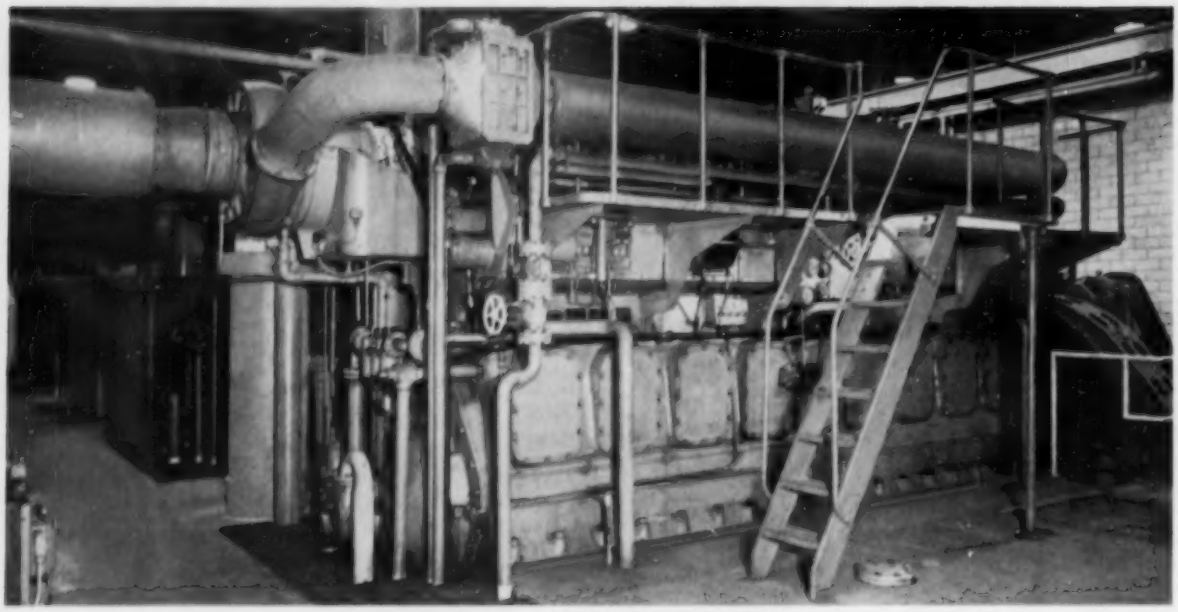
50 WEST 50TH STREET, NEW YORK 20, NEW YORK
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA

SHELL

The Agra Lite Cooperative near Benson, Minnesota houses five turbocharged Cooper-Bessemer Diesels, each rated 1850 hp at 327 rpm.

This view of Cooper-Bessemer Diesels at Benson shows after-coolers and exhaust-driven turbochargers. All five engines successfully use a No. 6 residual fuel oil.





How an "OIL CHANGE" saved $30,000 . . . in fueling Cooper-Bessemers

The ability of Cooper-Bessemer Diesels to run smoothly and effectively on either heavy fuel, light crude, or a combination of both, is but one of many reasons why so many Cooper-Bessemer units are being installed in cost-conscious plants throughout the country.

Here's an example . . . switching five 1850 hp Cooper-Bessemer Diesels from a higher priced lighter engine fuel to No. 6 residual fuel oil, the Agra Lite R.E.A. Cooperative near Benson, Minnesota effected a one year net saving of $29,769 . . . a remarkable 30% cost reduction.

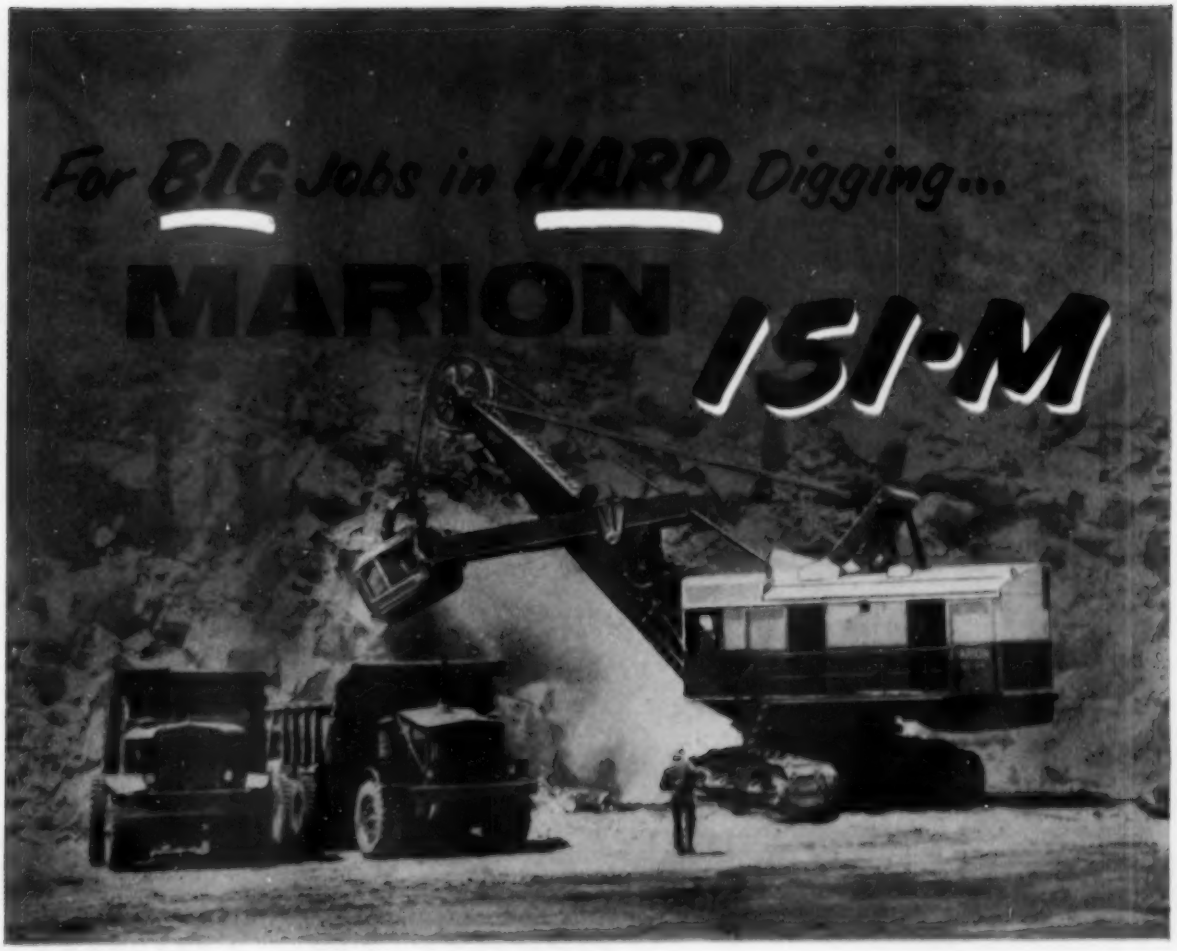
And important to note is the fact that this "oil change" resulted in *no* increased wear on the smooth-operating turbocharged Cooper-Bessemers. In fact, the cleaning of valves, fuel pumps and nozzles periodically has shown these parts to be just as efficient, just as clean as when much lighter fuel was used.

Next time, why not check with Cooper-Bessemer for the ideal solution to *your* particular power problems.

MOUNT VERNON, OHIO
COOPER-BESSEMER
GROVE CITY, PENNA.

New York City • Seattle, Wash. • Bradford, Pa. • Chicago, Ill. Houston, Dallas, Greggton, Pampa and Odessa, Texas Washington, D. C. • Shreveport, La. • San Francisco, Los Angeles, Calif. • St. Louis, Mo. • Gloucester, Mass. • New Orleans, La. • Tulsa, Okla. • Cooper-Bessemer of Canada Ltd., Edmonton, Alberta—Halifax, Nova Scotia.

DIESELS • GAS ENGINES • GAS-DIESELS • ENGINE-DRIVEN AND MOTOR-DRIVEN COMPRESSORS



OVER MILLION YARDS OF SOLID ROCK MOVED FOR TAIL RACE

Moving more than a million yards of rock for the tail race of a southern dam is a typical job for a MARION 151-M.

BIG jobs in HARD digging are common assignments for the MARION 151-M. A reputation for big production on mining projects throughout the world makes this 7-yard shovel a logical choice for the toughest construction jobs.

Ask for Bulletin 393 which shows some of the many design and construction features of the 151-M that make these performance records possible.

MARION / **MARION POWER SHOVEL COMPANY**
MARION, OHIO, U. S. A.

A Subsidiary of Merritt-Chapman & Scott Corporation

POWER SHOVELS FROM ½ TO 60 CUBIC YARDS
PILE DRIVERS • WALKING DRAGLINES

DRAGLINES • CLAMSHELLS • LOG LOADERS
CRANES, CRAWLER & RUBBER MOUNTED • BACKHOES

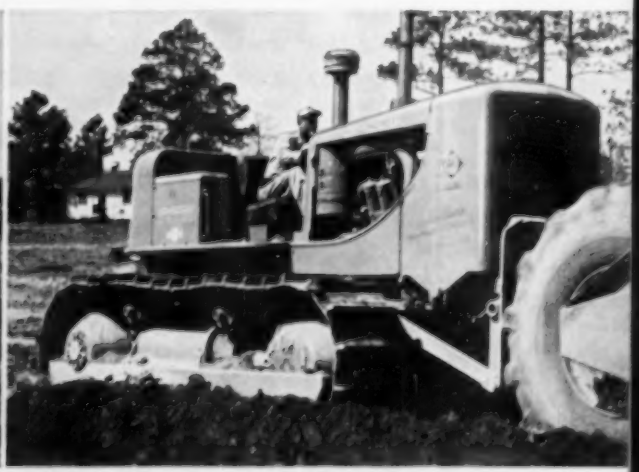
Your Confidence Is Justified *Where This Flag Flies*

Dozing hard sandstone in stripping and building access roads keeps two HD-21's busy at the Peerless Mine of Coal River Mining Company, Hookersville, W. Va. The HD-21's are working 16 hours a day, 7 days a week, moving up to 1,500 yd of material like this in each 8-hour shift.

new HD-21's AT WORK across the country

Allis-Chalmers HD-21's are meeting today's stepped-up demands on hundreds of jobs

Excavating and leveling land for an outdoor theater near Milwaukee was the first assignment for this HD-21. Kramp Construction Company was the first Wisconsin owner of one of these productive new tractors.



Push-loading scrapers is another of many uses for the HD-21. The torque converter drive automatically selects the speed and power necessary to help scrapers pick up a full load. Contractors Machinery Company, subsidiary of Grannis and Sloan, Fayetteville, N. C., is using this HD-21 for extending aircraft runways at Pope Field, Ft. Bragg, N. C.

Clearing, dozing and cleaning up around a 3-yd shovel . . . that's how Badget Mine Stripping Company uses its two HD-21 Allis-Chalmers Tractors. The units are working on the northeast extension to the Pennsylvania Turnpike in the Pocono Section near Wilkes-Barre, Pa.

New Allis-Chalmers tractors with advanced basic design features, job-proved during millions of operating hours, are going to work in your neighborhood. Ask your Allis-Chalmers dealer where you can see them in action.

Big dirt mover on the new Kenwood Plaza Shopping Center, Kenwood, Ohio (Cincinnati suburb), is this 44,000-lb HD-21. The contractor, John R. Jurgensen Company, will move an estimated 250,000 yd before the job is finished.

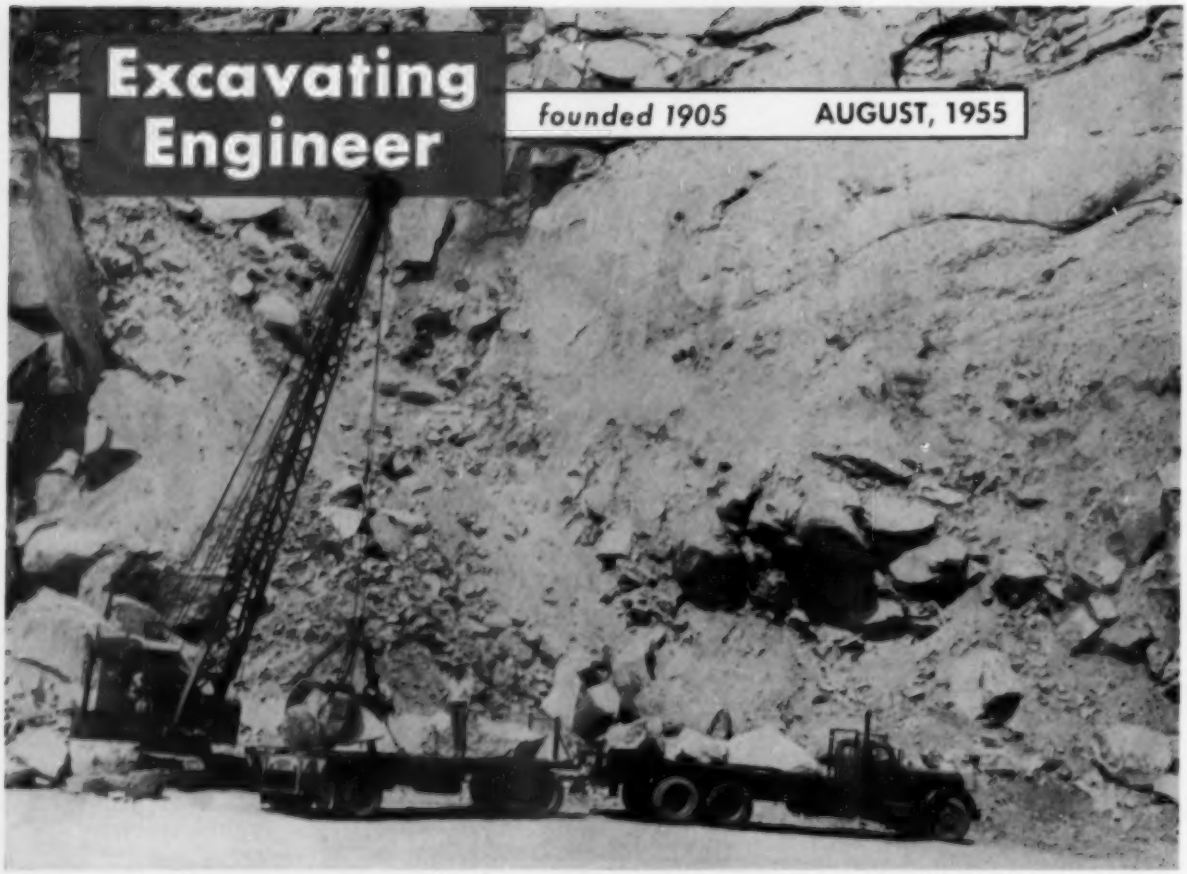
Pulling, pushing and dozing, two HD-21's owned by Ransome Company, Emeryville, Calif., are busy on the 4.4-mile, all-new Ygnacio Valley Road extension job in Contra Costa County, Calif.

Big jobs need big equipment and some of the biggest producers on the Indiana Turnpike are the many HD-21 tractors at work there. Here one of the 204-hp giants pulls a loader on a stretch for which Rieth-Riley Construction Co., Inc. is the prime contractor and Chapin & Chapin, Inc. the sub-contractor.

ALLIS-CHALMERS

CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Excavating Engineer
founded 1905 AUGUST, 1955



Working against mass of granite, Stringfellow's 22-B crane and Owen grapple loads trailer with rock for Redondo Beach sea wall.

It's Feast, Famine Efficiency for Quarry

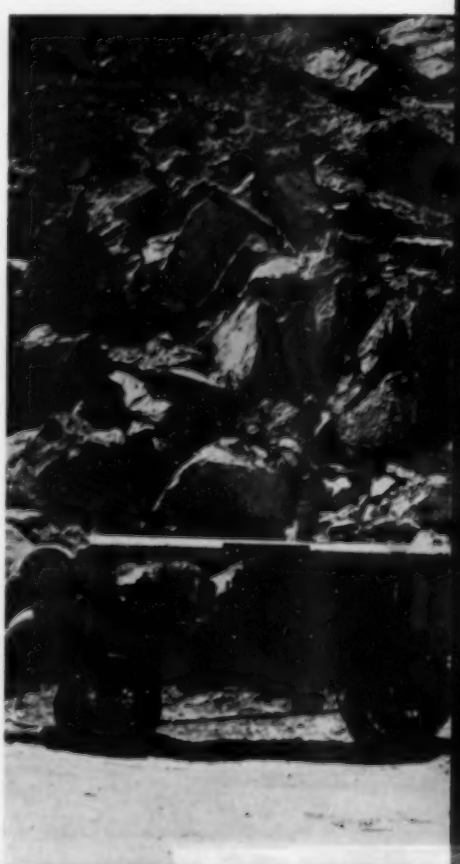
By Floyd Suter Bixby

ON a spring day this year, Jim Stringfellow, Jr., a frown on his face, sat in his office at the Riverside rock quarry in southern California. He wished that his father would return from a trouble-shooting assignment near Yuma, Ariz.—it might help remove some of the pressure from his young shoulders. It wasn't that things were going to pieces; it was only that they were mixed up somewhat.

Stringfellow's headquarters quarry at Riverside, already running close to its capacity of 1,000 tons per day, had just received an emergency order for 600 tons of rip-rap, to be delivered 50 miles away in Long Beach, Calif., on less than 24 hour's notice. The contractor calling for the rock was an old customer, the Bechtel Corp.

To add to the pressure on young Jim Stringfellow's shoulders, four other company quarries were then active. Several public works jobs were underway. The

J. B. Stringfellow Co. deals in all three as it specializes in quarrying derrick and rip-rap rock for public works jobs in California. Firm constructs heavy, 2,100 ft. sea wall.



outfit had contracted for rental of six big power shovels to supplement its own equipment. The firm also was speeding to completion a 2,100-ft. sea wall for the city of Redondo Beach.

That was April 6, 1955. What young Jim Stringfellow couldn't forget was that on July 1, 1955, so far as he knew, the company would be out of work.

Quarrying Many Years

Such extremes are typical in the rock quarrying business. The Stringfellow family has been quarrying rock for many years. When J. B. Stringfellow, Sr., first started in business, rock production was a simpler operation than it is today. By choice Jim Stringfellow has stuck with the production of derrick and rip-rap stone for public works jobs in southern California, declining to enter the crushed rock business. Stringfellow always has been a blue-granite man, as are the key people on his company payroll.

The production and handling of large-size rock has become a point of interesting up-and-down economic cycles in their lives. The Stringfellows, though, are content with their feast and famine, boom and bust existence. They have taken everything from 200 to 500,000 tons in stride in a year's time, and liked it.

One of the company's worst business years was 1954. Demand for large-size rock dropped off beyond proportion to normal demand because of a curtailment of public works. Derrick stone and rip-rap rock commonly are used in breakwaters, jetties, sea walls, the sides and toes of levees, and for various other erosion control measures around large buildings exposed to the waterfront. Despite the cut back, Stringfellow's men stayed on the payroll. They overhauled the major pieces of equipment and sharpened up their pencils for the next bids. By April, 1955 the bust was over and the feast was on again.

Working with cable slings, a Northwest 80-D shovel puts the first derrick rock on a truck bed. Stringfellow's Riverside quarry consists of 550 acres of blue granite.

Secondary drilling was formerly done using small compressors and jackhammers.

Efficiency Comes Naturally

The boom and bust cycles of Stringfellow's business have produced a somewhat unique type of excavating efficiency, all of which has grown largely through necessity. The Riverside headquarters quarry, for example, is turning out an average daily production of 1,000 tons of blue granite derrick stone with a small crew of 13 men. There was a time—and it was only a decade or so ago—when the production of that much rock in a day's time required at least 65 men. The mechanization of many of the operations, along with the retention of a small crew of key employees through tough business times, has made this possible. The Riverside quarry is a model of efficiency just as the other Stringfellow quarries are.

In addition to the Riverside location, Stringfellow quarries are located at San Diego, Oceanside, Corona, Long Beach and Oxnard. By having several locations from which to choose, the company is in a good position to bid on derrick rock needed for Corps of Engineers and Los Angeles County Flood Control District work.

The very nature of Stringfellow's quarrying calls for large, heavy rock of a type which almost automatically creates difficult problems. Let's assume, for example that the company obtains a contract commitment for 100,000 tons of derrick stone. Specifications for that material usually call for room-sized rock in the 10-ton range. The company has found that the best way to produce rock of that size out of the side of a granite hill is to tunnel in from the bottom with coyote holes, making T-shaped drifts

This Pitman Giraffe and shop-built platform carrying Gardner-Denver wagon drill revolutionized Riverside secondary drilling.

which lateral off both ways from the end of the coyote and bring the entire shot down in a mass of big chunks.

Such shots are problems. Until Stringfellow began to double up in its detonating methods, company officials were very anxious for weeks preceding a blast. Even with the shot pulled successfully, the secondary drilling problem was, until recently, most pressing.

Mechanizing operations completely, Stringfellow gradually has amassed a fleet of good equipment, built up around normal needs. The company's equipment includes a Bucyrus-Erie 22-B crane, which also has a dipper stick and shovel attachment, a Manitowoc Model 3000 and a Northwest 80-D. Tractor equipment includes two Caterpillar D8s, a Caterpillar D4 and an Allis-Chalmers HD-14. Compressor and drilling equipment includes two Gardner-Denver 365-cfm compressors, an Ingersoll-Rand 315 Gyro-Flo, a Chicago Pneumatic 210-cfm machine, a Gardner-Denver wagon drill and an Ingersoll-Rand wagon drill.

Firm Buys 'Giraffe'

The firm's newest machine is a Pitman Giraffe, whose use has reduced secondary drilling costs dramatically, as will be detailed later. The company also owns seven dump trucks and numerous pickups, welders and small tools.

When the boom cycles come and business volume zooms, the company rents equipment. When *Excavating Engineer* visited the operation in April there were 26 large rented Sterling Autocar and Diamond T trucks and semi-trailers hauling derrick stone between Riverside and Redondo Beach. At its San Diego quarry, the company had two 1½-yd. Northwest shovels rented. The Long Beach operation was using a rented 2-yd. Lima shovel and two 1½-yd. Bucyrus-Erie 38-B's. As normal business volume increases to the point where more rented equipment is being used, the policy is to add to company-owned equipment. Stringfellow now is considering the purchase of a larger crawler crane.

The Riverside quarry is a typical example of the company's speed and efficiency in producing large-size rock. The quarry site was purchased 2½ years ago. It consists of 500 acres of solid blue

Jim Stringfellow, Jr., superintendent of Riverside quarry, checks the Chicago Pneumatic 210 compressor which powers wagon drill. Unit is mounted on a Ford F8 truck.

granite in a mountainous area. Limited quarrying had been done at that location previously, but the site had not been developed to the point where Stringfellow has it opened up today. The present face is 1,000 feet long and averages 100 feet high. The rock formation is a solid blue to blue-black granite, some containing well-distributed flecks of porphyry.

In developing the main coyote holes, drillers tunnel horizontally at right angles to the toe of the face, going in 50 to 60 feet. At right angles from the end of this horizontal bore, a longitudinal drift tunnel then is drilled. On the last major shot, for example, one of these longitudinal legs was 54 feet long; the other was 70.

This tunnel work is being done by conventional methods. One of the portable air compressors is used for driving a drill. The drill mounting is a "Swedish Leg," a powerful holding device which allows maximum movement of the drill and yet gives the driller firm support for his machine. Tungsten carbide drill bits, usually Brunner-Lay Rok-Bits, are being used on this work. Trojan gelatin-type powder and Atlas Rockmaster delay caps up to No. 7 pull out the granite from the center of the tunnel in a pyramid cut, then crack the side rock in around the center break.

Each 100-ft. coyote tunnel is heavily loaded with approximately five powder pockets, generally using Trojan bag-type explosives in 40% strength. The powder ratio is approximately three-fourths pound per cubic yard. Only one such coyote hole, consisting of the horizontal tunnel and twin longitudinal extensions, is shot at one time.

The possibility of a defective misfire always has been a source of worry to Stringfellow officials. Several years ago, in the San Diego quarry, part of one powder pocket failed to explode, and was found later. Fortunately, however, the rock wall did break so that the secondary drilling job was not much worse than usual. Such a thing could be a serious, expensive matter if some of the powder pockets failed to go off completely.

To prevent that from happening, the company is spending approximately $100 extra on each of its shots to equip each powder pocket with at least three detonators. A Primacord trunk line is run inside the horizontal tunnel, down one lateral leg where it is looped around each powder pocket, back through this leg and around each powder pocket in the opposite lateral, and then back out through the horizontal tunnel, where each end of the trunk line is equipped with an electric blasting cap and a stick of dynamite. Two separate sets of electric blasting caps also lead into each powder pocket. When a shot is fired, each powder pocket has three ways of being exploded. The worry factor has been decreased greatly.

For many years the secondary drilling problem, in the wake of coyote-hole main-line work, has been severe. Great chunks of broken granite, some as large as a house, always are left in the wake of such explosions. Until a few months ago, the only way to break down these chunks into derrick stone without leaving excessive small fragments was to secondary drill the boulders with small compressors and a jackhammer. That was an expensive, time-consuming process, because veteran drillers whose judgment was needed in placing the secondary holes and powder couldn't clamber down over 100-ft. cliffs on the end of a rope. Young men with agility to do this dangerous job safely often lacked the mature judgment necessary to drill efficiently such oversize rock.

The company recently solved that problem by bringing in a new Pitman

Last stop before trucks leave the quarry is weighing station, to insure that loads do not exceed the California weight limit.

Stringfellow's Manitowoc 3000 takes a big rock from truck that brought it from the quarry and prepares to place it in sea wall with special Clyde Wood rock grapple.

Giraffe and mounting a wagon drill on a platform at the end of the boom. Hydraulic controls, mounted on the drill platform, permit the drill operator to raise himself 38 feet in the air and a maximum of 28 feet beyond the back end of the rig. The machine is truck-mounted, has a Wisconsin engine-driven hydraulic pump and a Chicago Pneumatic 210-cfm compressor. A 3-in. Gardner-Denver wagon drill is on the drill platform.

Drilling Costs Reduced

The Pitman machine was developed originally for tree trimming work, but gradually proved useful to ground crews of large airplanes in refueling and repair work. It has revolutionized secondary drilling at the Riverside quarry. Wear on air compressor hose, jackhammers and the like has been reduced considerably. Secondary drilling costs have been cut to the bone. Equipped with its truck mounting, the machine can back up to any point of the quarry face, and a skilled driller can man its platform to dispose of the secondary drilling work.

Breast holes, down holes and slope holes all can be drilled with equal ease. Formerly, many secondary drill shots had to be wired electrically because there wasn't time for drillers to get out of the way if they used old-type fuses. Use of the new machine now permits the use of the old-type fuses for setting off the secondary powder shots. The innovation has brought new efficiency into Stringfellow's operations by solving one of the company's worst, most expensive problems.

Under normal operations, broken rock at the Riverside quarry is loaded by two machines—a Northwest 80-D equipped with a 2½-yd. rock dipper, and a Bucyrus-Erie 22-B rigged as a crane and carrying an Owen rock grapple. Derrick rock is loaded out by the 80-D by banding each stone with wire rope slings, handled from the dipper teeth. When a truck gets close to its maximum permissible load, under California highway regulations, the truck is weighed and then returns to the crane which fills it up with smaller sized rock until a maximum payload has been reached. The final loads are weighed carefully before leaving the area to prevent the possibility of overloading and fines.

When *Excavating Engineer* visited the Riverside location, the disposal of the quarried rock also was interesting. The rock was being hauled approximately 60 miles one way, to the city of Redondo Beach on the Pacific Ocean, where a 2,100-ft. sea wall was under construction by the contracting part of J. B. Stringfellow Co. Construction of the 20-foot-high barrier, a replacement for an earlier 11-foot-high sea wall which the ocean tore to pieces, was expected to solve one of Redondo Beach's perennial spring problems: ocean-front battering by heavy waves.

Surf Pounds Seaboard

The strand along the beach at Redondo formerly was one of the finest resort areas in southern California. The beach was beautiful. Seashore property soon began to appear. Then, after certain offshore structures were built, something happened to change the littoral drift. Hydraulic currents began to behave differently and the Redondo Beach bathing area began to wash out. Soon the highway bordering the beach was gone. In recent years, excessive spring pounding by heavy surf has ruined much seashore-front property and damaged other buildings.

In an effort to correct the situation, Redondo Beach, with state aid, designed the sea wall and let the contract to the Stringfellow organization. To reduce the heavy shock of frontal battering of heavy surf under high tides, waterfront engineers designed the oceanward side of the new sea wall with a 2 to 1 outboard slope, replacing the 1½ to 1 slope which had been used on the previous sea wall. Specifications called for 75% of the rock in the structure to range from five to 12 tons in weight, with smaller pieces in the other 25%. Stringfellow exceeded the intent of specifications by placing considerably heavier derrick stone in some places. Rock up to 19 tons was handled regularly by the Manitowoc 3000 crane, which Stringfellow moved down from the Ventura Quarry for the job. The Manitowoc 3000, rated at 30 tons, had been beefed up by the addition of counterweights so that it could handle weights up to 45 tons or reach

A large chunk of rock heads for the proper size hole in the sea wall. Placement of stones so they interlock presents problems.

out with a comparatively flat boom to handle the heavy stone.

In places where the old sea wall had not completely eroded, the new construction was tied into the previous work by rearranging the lower stones and setting the new ones in to develop the best possible bond. As the pieces went in, all rock joints were staggered. A special two-prong rock grapple, manufactured originally by Clyde Wood Co., was used on the Manitowoc 3000 for stones weighing five or more tons. An Owen four-prong grapple could be interchanged easily for pieces under five tons.

Road movement of the 20 to 26-ton hauling trucks was synchronized carefully so that the trucks did not congregate either loaded at Redondo Beach or empty at the quarry. Working quarters

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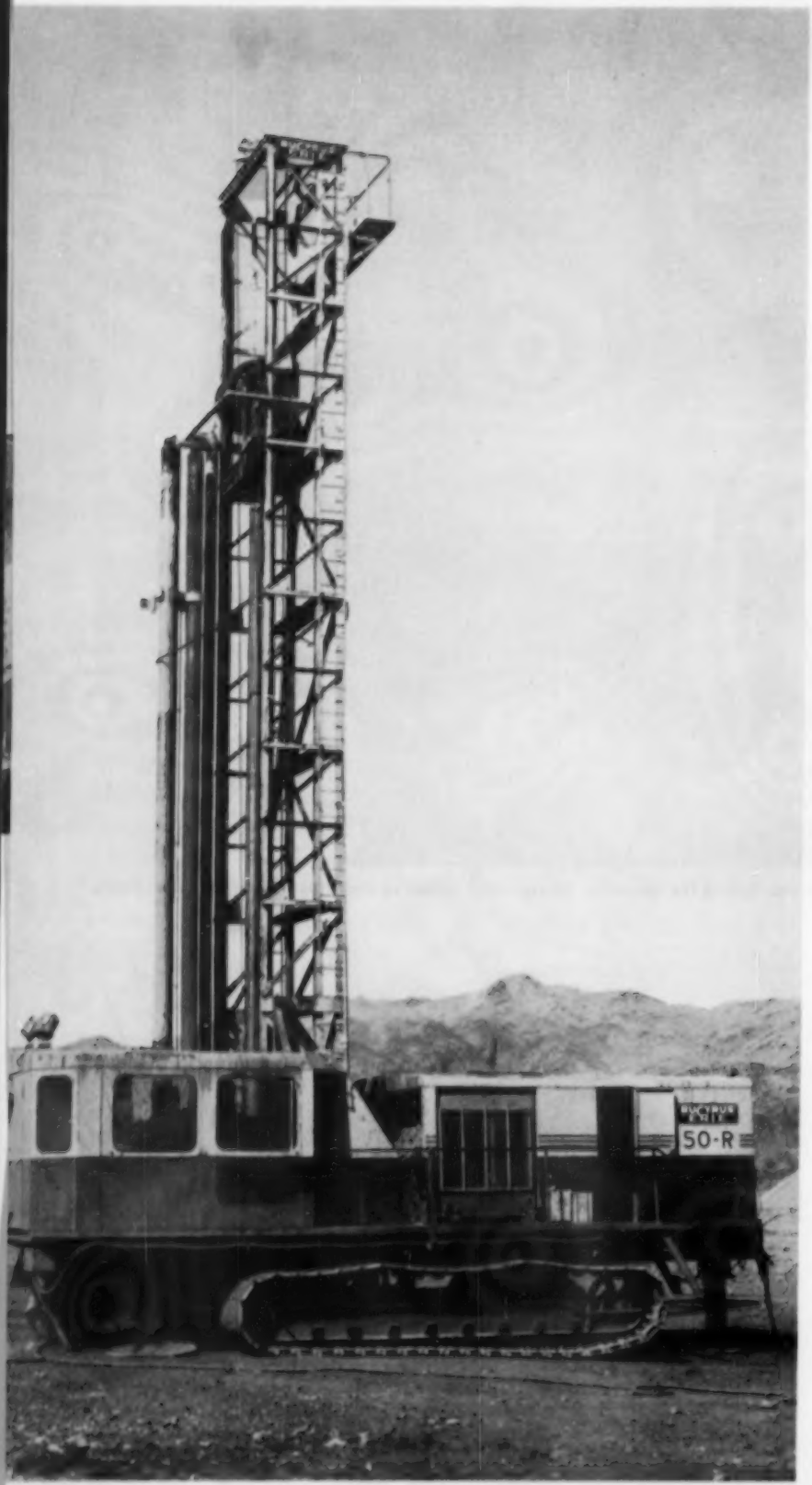
Bill Schmidt, sea wall superintendent, watches his operator place a rock.



Turning in an excellent performance at Eagle Mountain under tough conditions is this Bucyrus-Erie 50-R rotary drill. The new drill has boosted production of iron ore.

Kaiser Modernizes Eagle Mountain

by Ray Day

ABOUT 175 miles east of Los Angeles, Calif., at Eagle Mountain, where Kaiser Steel Corp. operates one of the west's largest iron-ore mining spreads, an intensive modernization program has brought the mine up to date with the Fontana (Calif.) steel mill, which it supplies. The newest-type rotary blast-hole drilling equipment, an extra Bucyrus-Erie 150-B shovel and a new beneficiation plant recently were added to the mining operation with dramatic results. The drilling and shovel equipment has boosted production and lowered production costs. The beneficiation plant has reduced by 20% the volume of material which otherwise would have to be hauled 145 miles by rail to the Fontana mill.

The Eagle Mountain ore mine reveals one of the most interesting applications of construction and mining equipment in the west, chiefly because of a large-scale downhill hauling and excavation operation in heavy, hard ore. The modernization program is in keeping with the industrial facts of life for southern California. Increasing demands by heavy industry on the Fontana mill have made it necessary for Kaiser to enlarge the plant and streamline efficiency wherever possible. Because the Eagle Mountain mine is an important part of that production link, the additions already made there are a part of this natural chain of events.

Of special interest to drillers is the fact that the world's biggest and most modern rotary drill, the Bucyrus-Erie 50-R, has been brought to Eagle Mountain. Its introduction has produced a somewhat new blasting technique.

Eagle Mountain's ore is a massive, heavy formation, high in iron content and considerably heavier than most rock. To compensate for this heavy material, Kaiser has made a general policy of using slightly smaller dippers on ex-

These two 42-Ts helped to show Kaiser Steel Corp. that well spaced, big-diameter holes will do an excellent breaking job.

cavating equipment than is standard for a given model.

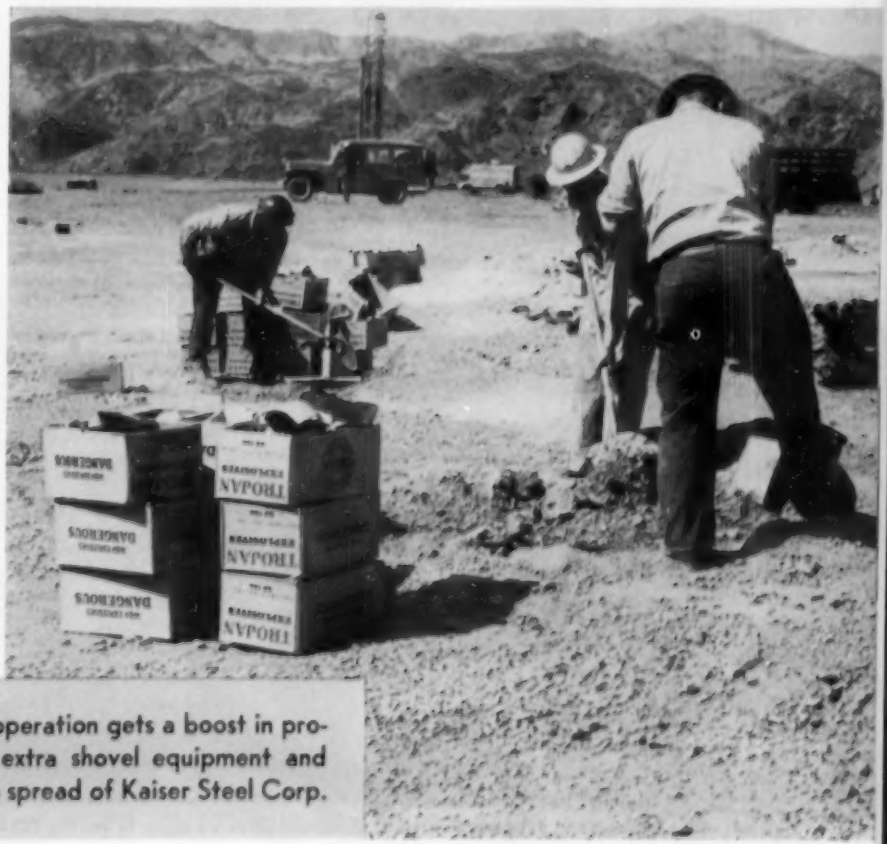
High Production Quota

Eagle Mountain mine is operating on an average production quota of approximately 400,000 tons per month, including both ore and waste material. Occasionally, as mill demands require, production goes up to 450,000 tons per month. The mine is seven years old. Its various open pits, with well-established berms and benches, are well opened, making full efficiency possible. All ore produced by Eagle Mountain supplies three huge blast furnaces at Fontana which dump hundreds of tons of steel daily into the industrial lifestream of the west.

The ore is hauled by rail to a shipping point on the Southern Pacific main line, from which point it moves by regular Southern Pacific trains to the Fontana plant.

Kaiser's purchase of the Bucyrus-Erie 50-R rotary drill has changed Eagle Mountain's entire drilling program. In

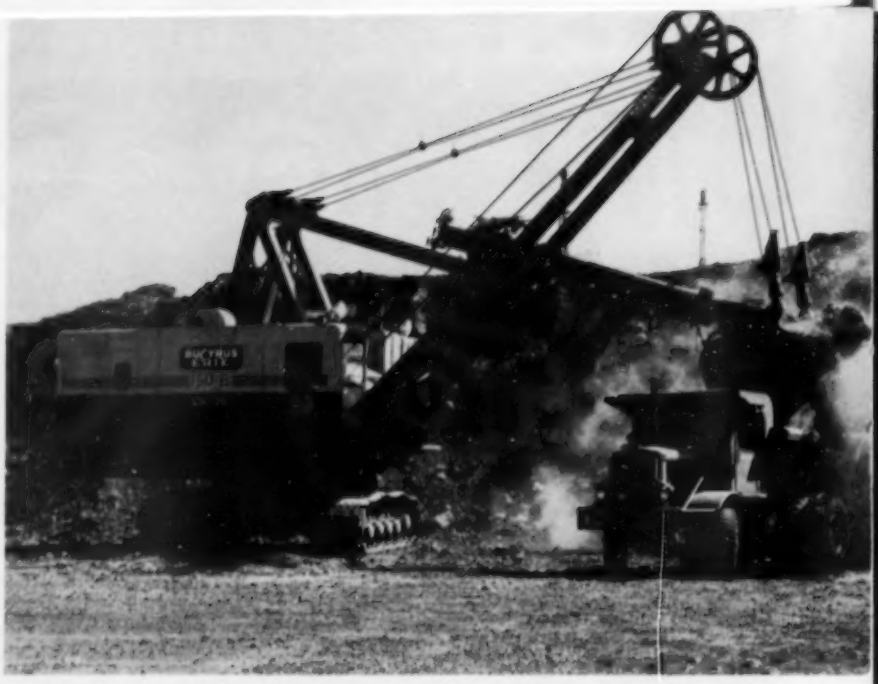
Working fast, powdermen load Trojan bag powder behind the 50-R drill. Machine opens up large powder capacity. Eagle Mountain is 175 miles east of Los Angeles.



West's biggest iron ore mining operation gets a boost in production as newest rotary drill, extra shovel equipment and beneficiation plant are added to spread of Kaiser Steel Corp.

fact, the original purchase of the 50-R for drilling such a hard formation as Eagle Mountain ore represented the type of daring for which Kaiser's management is well known. Until the 50-R was brought to Eagle Mountain, it had never been in formation as tough as it found there. It had given an excellent account of itself in coal fields, in limestone and other relatively easy drilling. How the machine would perform in material which normally requires tungsten carbide inserts, however, was not well known.

When the 50-R was purchased, the company was using six Bucyrus-Erie 42-T blast-hole drills. They had given a good account of themselves. Drilling 9½-in. diameter holes, the 42-Ts had averaged eight feet per drilling hour, had given generally trouble-free performance and had handled successfully the toughest material at the mine. These machines had demonstrated the sound-



Newest machine on the Eagle Mountain line is this 150-B shovel. The 150-B has helped step up the mining potential at Eagle Mountain, which supplies the Fontana steel mill.

A "jack of all trades," the Bucyrus-Erie H-3 Hydrocrane gives an assist to the big 150-B shovel as workmen make a cable change.

Bucyrus-Erie shovels are used exclusively at Eagle Mountain for loading broken ore, overburden. Here, 120-B loads Euclid hauling unit from bank typical of excavation.

ness of the big-diameter powder hole theory—that big-diameter holes spaced far apart would do an excellent job of breaking material.

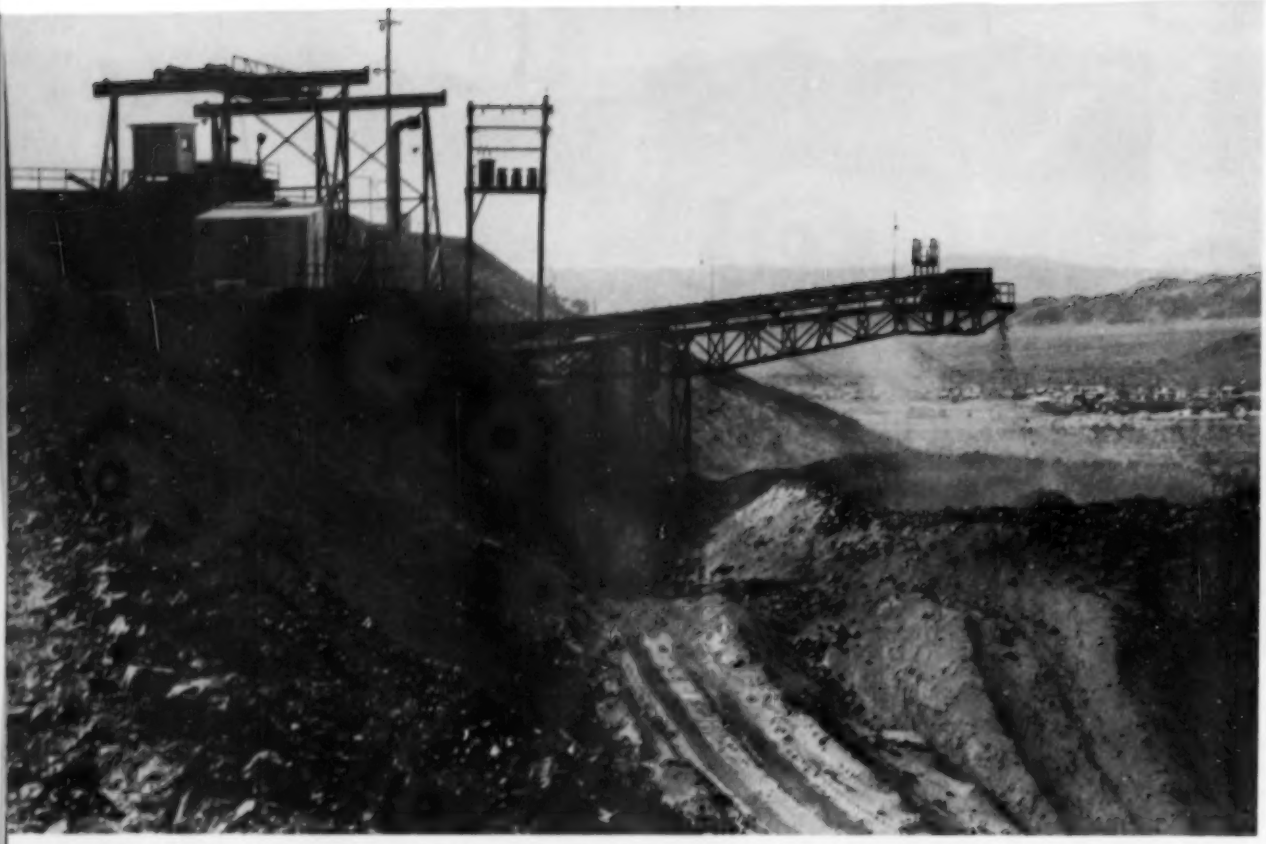
In six months, the 50-R rotary has shown Kaiser officials what they can expect from its purchase. Working on holes an average of 35 feet deep and 9⅞ inches in diameter, the machine has delivered a high-performance figure of 426 linear feet of hole in seven hours. Performance also has dropped to a low of 55 feet in seven hours when the hardest formations were drilled. The 50-R averaged 25 feet per drilling hour in its first six months at Eagle Mountain. The machine has eliminated four 42-Ts from the drill fleet. Its production in the hardest material, which is a combination lime silicate and monzonite, has been higher than the general average for blast-hole drills.

The 50-R has brought a sharp decrease in the amount of bit work necessary. The Hughes W-7R Tri-cone bit is most used. It gives drill footage ranging from 55 to 60 feet in the hardest material and up to 1,230 feet in easier drilling. A special rotary tungsten carbide bit also was tried, but the reduced drill rotation necessary to protect it was believed to overshadow its other advantages. The Hughes Tri-cone bits regularly deliver an average of 420 linear feet of hole. That is a good drilling investment, mine officials said.

Power is fed from high-tension lines to drills and shovels through this type of easily moved, safety-breaker skid box. Lines do not interfere with high booms, derricks.

Vary Drilling Pattern

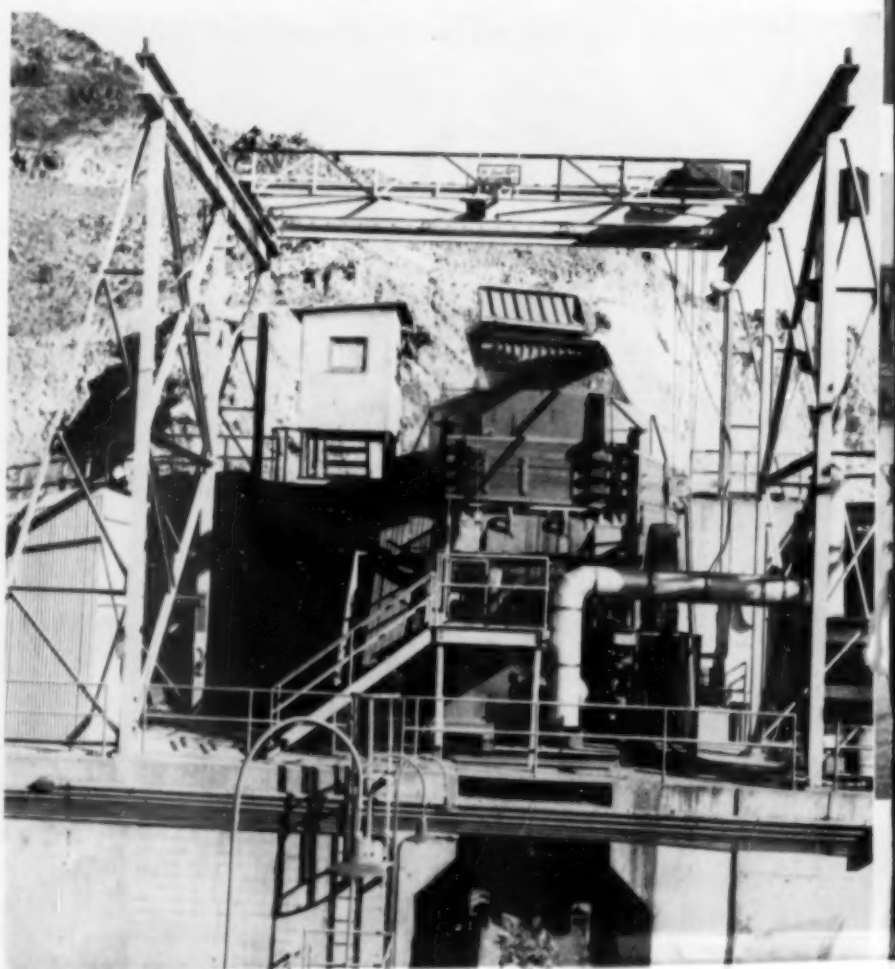
Drilling by the 50-R follows a somewhat varying pattern, the same as it did with churn drills, depending on the varying degrees of hardness in the iron ore. In some formations, the holes are drilled 18 x 20 feet on centers, while in lighter, easier excavation the centers can be lengthened out to 26 x 28 feet. Kaiser uses a unique method of bringing electric power to the 50-R and the power shovels, so that high-tension lines do not interfere with the free movement of the drill and other equipment. High-tension lines are brought into the general area on portable aluminum poles which are tall, light and easily handled. They



Blasted ore, after passing through big jaw crusher, drops from this surge pile through reduction, concentration equipment.

are set in drill holes dug by the 50-R. Long power cables and special safety-breaker skid boxes, which can be moved around by Cats or some of the hauling trucks, then carry power from the high-tension lines over the work area. This method of transmitting power has eliminated the usual interference with high booms or derricks on mining equipment.

Several features of the 50-R have lent themselves well to Eagle Mountain's drilling, according to Kaiser officials there. The ability of the 50-R to vary its drill rotation and its down-pressure, has allowed the machine to handle all formations—hard or soft—with optimum efficiency and speed. When the pictures for this article were taken, for example, the machine was in medium-hard drilling and was carrying a new bit. Under those conditions, the operator was using approximately 50,000 pounds of down-pressure on the bit, which was rotating at 53 rpm. In lighter drilling, of course, the speed of rotation could be increased and down-pressure could be decreased. The 50-R has available down-pressures as high as 90,000 pounds. At a



This Birdsboro 66 x 84 primary jaw crusher reduces iron ore chunks to 8-inch-minus material on their way to concentrating plant at Eagle Mountain.

slow-rotation speed, this down pressure would help a bit chew rapidly into the hardest of materials.

Pulverized cuttings from the drill hole are brought to the ground surface and piled. They are available for later use as stemming, covering the powder charges. Using one operator and one helper, the 50-R has eliminated many man hours, considerable equipment, congestion and cost from the drilling operation.

Two Bucyrus-Erie 42-Ts still are being used. These machines have given many years of good service; in particular, they have given an excellent account of themselves in tough material. Complete Bucyrus-Erie bit sharpening facilities are available at the central shop headquarters at Eagle Mountain.

Holes Column Loaded

After a row of holes has been drilled, either by churn drill equipment or the 50-R, it is column loaded by pouring in bags of Trojan free-flowing 40% powder. The explosive ratio runs approximately 2/3 pound of powder per solid cubic yard of material, measured in the bank. The shots are being pulled by running a Primacord lateral and a stick of powder in each hole, then tying these laterals to a Primacord trunk line. The trunk line is exploded from a power source in the mine area.

This is the central repair and maintenance shop at Eagle Mountain. The mine operates on an average production quota of 400,000 tons per month of ore and waste.

Loading and hauling of material at Eagle Mountain is one of the most interesting and difficult such assignments on the West Coast. While the stripping can be wasted at a comparatively high elevation, all of the heavy iron ore must move downhill to reach its concentration and shipping point. This downhill move has created a fine proof-testing ground for hydraulic retarders. Some of the hauling equipment is

Continued on page 72

Beneficiation plant, recently added at Eagle Mountain, has reduced by 20% amount of waste material sent to Fontana steel mill.

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INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

Up goes the Wabash ave. bridge in Chicago as two barges carrying 450-W, 5-W walking draglines are towed through river.

Draglines Float to Seaway

Badgett Mine Stripping Corp., awarded 4-million-yard earth moving job on Seaway project, floats 450-W and 5-W machines 2,000 miles, from the Kentucky coal fields to Massena, N. Y.

A 650-TON walking dragline and another of 170 tons, both of which will work on the St. Lawrence Seaway project, were towed from Kentucky to Massena, N. Y., during May and June, by way of the Illinois Waterway and the Great Lakes.

The two units — a Bucyrus-Erie 450-W, (nicknamed *The Gentleman*), with a 165-ft. boom, and the smaller 5-W, with a 135-ft. boom—completed the 2,000 mile trip from the Kentucky coal fields to Massena in 68 days. The machines are owned by the Badgett Mine Stripping Corp., Madisonville, Ky., which was awarded the first earth-moving contract by the St. Lawrence Seaway Development Corp., for $1,372,800.

The machines walked 18 miles from the coal pits, near Madisonville, to the Pond River to meet a pair of 195-ft. barges. Both draglines walked onto the deck of one of the barges under their own power. Boom equipment was lashed to the deck of the other barge.

With the barges riding tandem, the gear had an overall length of 390 feet. Overall width was 35 feet; height above waterline, 35 feet. Two barges were needed for the trip to Chicago because of different water levels encountered. One barge was utilized for the remainder of the trip.

This lone barge was well loaded. The 450-W boom was on the side of the barge; the 5-W boom rested on top of the A-frame of the 450-W. The barge also carried about six dragline buckets with capacities up to 15 cubic yards, an Allis-Chalmers HD-20 dozer, two Jeeps with welding equipment, a General Motors boom truck and many spare parts.

The long tow began May 12, following the Pond, Green and Ohio rivers to Cairo, Ill., then the Mississippi and Illinois rivers, Chicago Sanitary and Ship Canal and the Chicago River to Lake Michigan. The barges passed through 16

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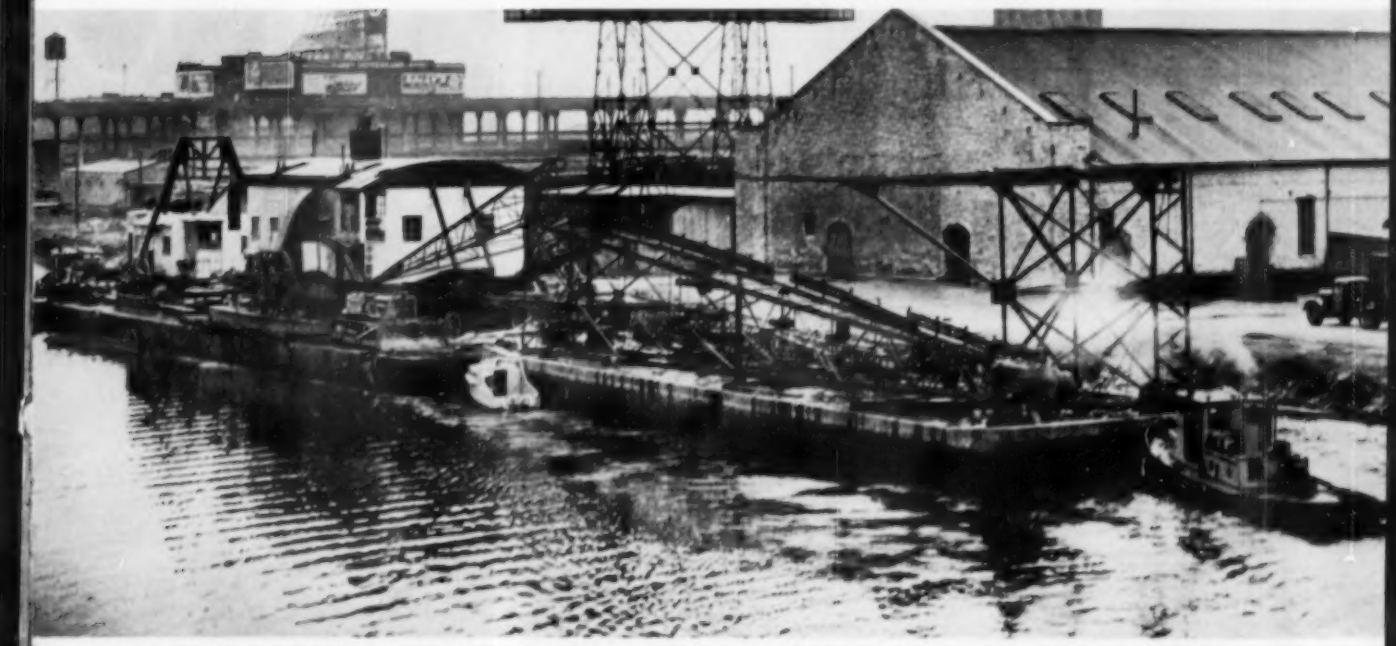
An Athey PR21-Cat DW21 haul unit dumps the first load of rock taken from Seaway project on dike in Montreal, Que. Outfit is owned by McNamara Pigott Peacock.



Tugs guide barges through Chicago River channel. Later, equipment was loaded on one barge for trip from Chicago to Massena.

Firm Blasts in Unusual Pattern

New Jersey quarry, in populous area, uses short-period delay caps, good stemming.

AN unusual blasting pattern has been utilized by a New Jersey firm to continue quarrying in a heavily settled residential area profitably and amicably. The firm is the Union Building and Construction Co. of Clifton.

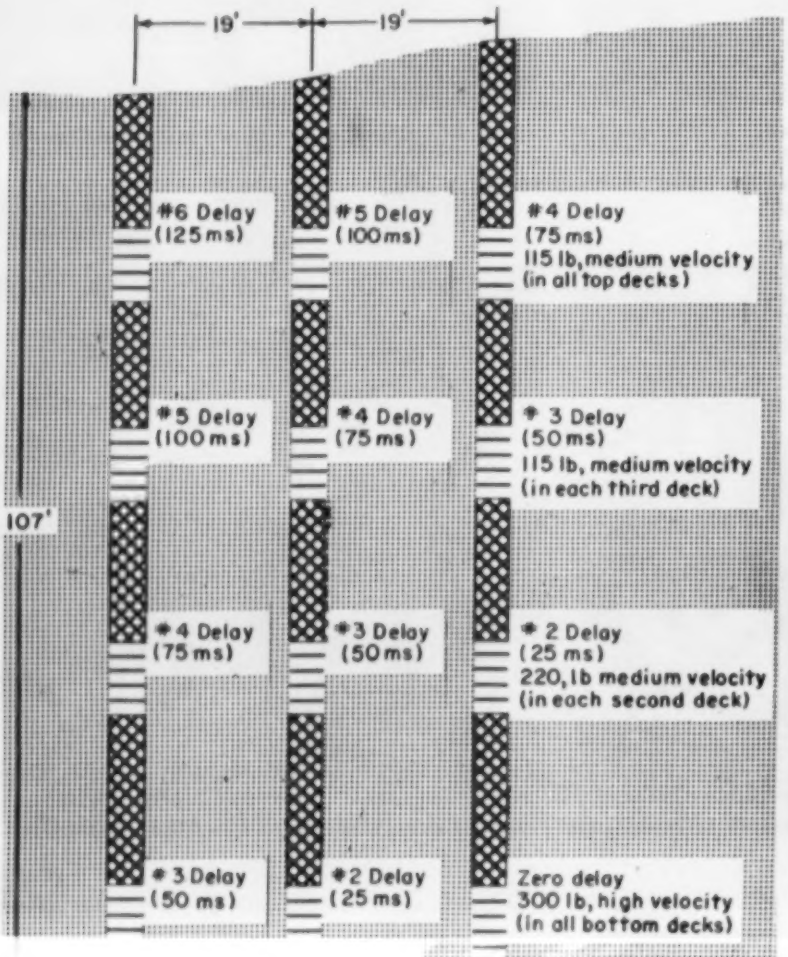
The blasting pattern was devised by Nicholas Van der Kamp, Union's quarry superintendent. Effective shots are produced through use of short period delay caps, gelatin-cored ammonium-nitrate cartridges and adequate stemming. Public complaints have been eliminated.

Union shoots three 107-ft. holes spaced 19 feet apart and with an 18-ft. burden. Each hole is loaded with 750 pounds of powder, placed in four equally spaced decks. The bottom decks contain 300 pounds of Atlas Apex #4HV, with a velocity of 17,000 feet per second. Each second deck contains 220 pounds of Apex #2MV with a velocity of 15,000 feet per second. In the two top decks, the remaining six charges contain 115 pounds of Apex #2MV. (See sketch below).

Pulling the toe of the burden is insured by locating the largest and strongest charge in the bottom of the holes.

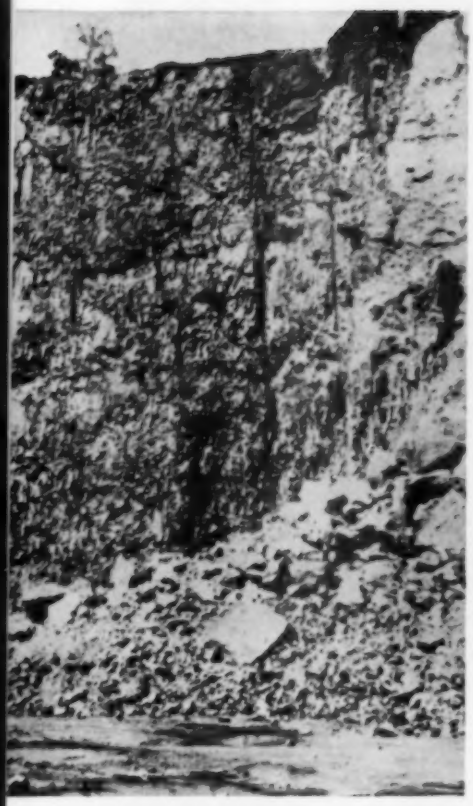
The 12 separate charges are initiated by Atlas Rockmaster millisecond delay blasting caps, arranged to direct the throw downward toward the quarry floor. The caps are placed in this order: bottom decks, delays 0, 2, 3; second decks, delays 2, 3, 4; third decks, delays 3, 4, 5; top decks, 4, 5, 6. This provides a total delay time of 125 milliseconds between the first and last charge and 25 milliseconds delay between succeeding charges.

Success of the blasting system, Union feels, is because the blast is broken into smaller increments and it is initiated at the bottom of each charge.


19'
19'
107'
#6 Delay (125 ms)
#5 Delay (100 ms)
#4 Delay (75 ms) 115 lb, medium velocity (in all top decks)
#5 Delay (100 ms)
#4 Delay (75 ms)
3 Delay (50 ms) 115 lb, medium velocity (in each third deck)
#4 Delay (75 ms)
#3 Delay (50 ms)
2 Delay (25 ms) 220, lb medium velocity (in each second deck)
#3 Delay (50 ms)
#2 Delay (25 ms)
Zero delay 300 lb, high velocity (in all bottom decks)

Above: One-third second after blast is initiated, only movement is at right.

Excavating Engineer



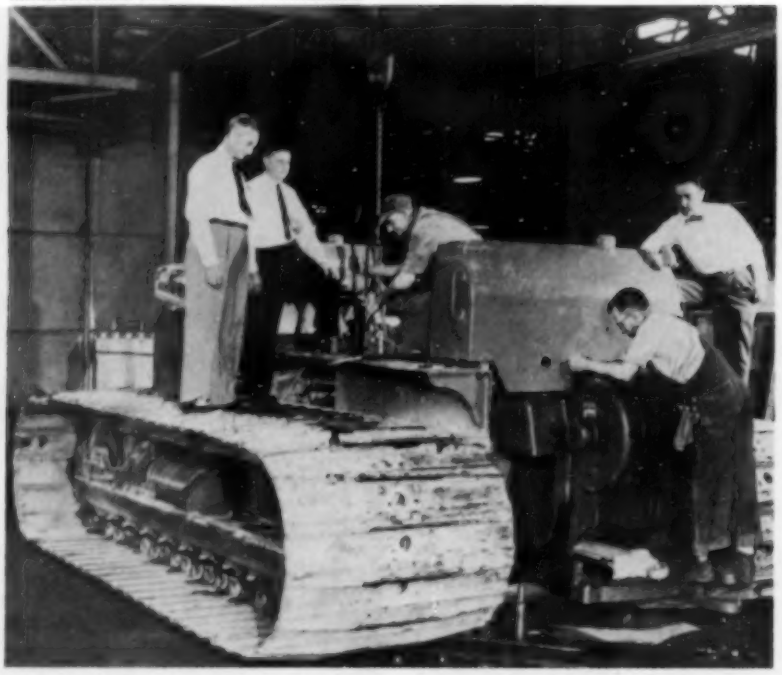
Below: Two-thirds second after initiation, entire burden heads down and out.

Above: After a full second, the entire burden is falling. Note lack of wild rock.

Below: The end result is a well broken, well-placed pile. Crane is a Koehring.

(in all bottom decks)

News from the Field



A modified Cat D8 (above) is one of 24 tractors being manufactured by the Caterpillar Co. for use in Admiral Richard E. Byrd's Deepfreeze expedition to the Antarctic.

Byrd to Guide Expedition

Rear Admiral Richard E. Byrd's Expedition Deepfreeze will begin work this winter on three observation sites in the frigid Antarctic. The observation sites will be used by the United States in connection with the program for the 1957-'58 International Geophysical Year scientific studies.

Other countries also will set up stations in the Antarctic and will conduct co-ordinated observations in meteorology, glaciology, geomagnetism and cosmic rays.

Caterpillar Tractor Co., Peoria, Ill., is specially manufacturing 24 tractors and 16 electric generators for the expedition, which will be conducted in temperatures down to minus 65 degrees.

Ten crawlers will be modified 155-drawbar horsepower Cat D8s with extra-wide and extra-long tracks. They will have nine-roller track frames, 54-in. shoes and 106-in. gauge. They will be equipped with hydraulic dozers and Hyster D8D towing winches, except for four machines which will have Hyster TLA8 cranes.

Nine other crawlers will be Cat D2s with 38 drawbar horsepower. Three Cat D4s will be equipped with fork lifts. Two other tractors will be standard D8s. Of the electric sets, 13 will be D315s and three D342s. They will be self-regulating—the D315s delivering 30 kw and the D342s, 100 kw.

The expedition, Byrd's second to the Antarctic as officer in charge, will depart in November. Navy Task Force 43, with Rear Admiral George Dufek, USN, as task force commander, will construct the observation sites.

A main station for the expedition will be established in the Little America area. Parties will move from there by tractor trains in Oct., 1956 to set up the second station in Marie Byrd Land. Material moved by air will be used later to erect a third station at or near the South Pole.

Primary use of the D8s will be on tractor trains. The D2s will construct snow runways in connection with two Seaman Roto Tillers. The D4s will load and unload aircraft. One of the D2s and three D315 diesel electric sets will be assigned to the South Pole weather station, the Navy said.

Merton Mark IV Overloader, built by Merton Engineering Co. Ltd., Feltham, England, loads material taken from excavation for recently completed London Airport hangar.

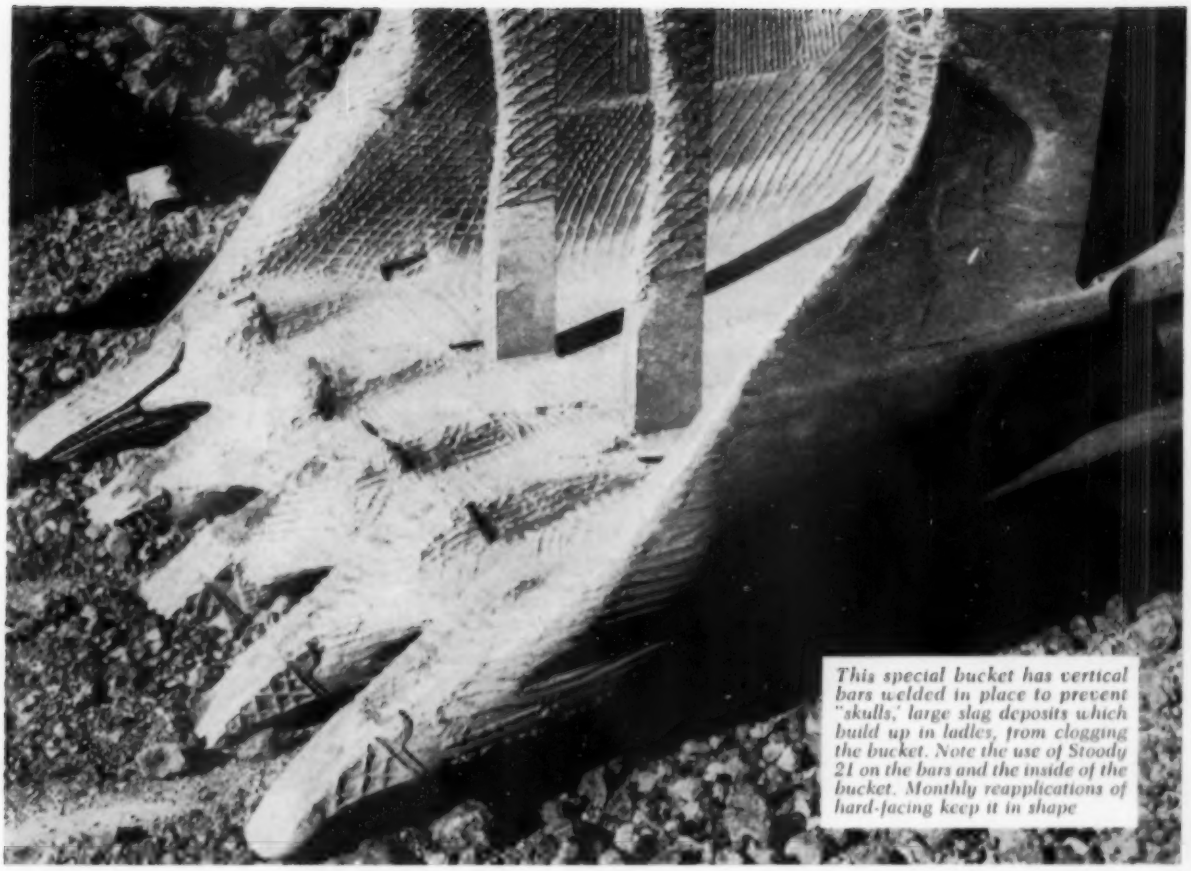
GM to Stage 'Powerama'

Contributions of diesel and aircraft power to America's industrial economy will be portrayed when the General Motors Corp. stages an outdoor exposition on the lakefront at Chicago, Ill., Aug. 31-Sept. 25.

The exposition will be held on the site of the 1933-'34 Century of Progress exposition, adjacent to Soldier Field.

Theme of the "Powerama" will be

Continued on page 50



This special bucket has vertical bars welded in place to prevent "skulls," large slag deposits which build up in ladles, from clogging the bucket. Note the use of Stoody 21 on the bars and the inside of the bucket. Monthly reapplications of hard-facing keep it in shape

GETTING BETTER SERVICE FROM ALL TYPES OF BUCKETS

Down in Birmingham, Alabama, there is a company that really knows all about buckets—the Birmingham Slag Company. This organization is chiefly concerned with the reclamation of blast furnace slag which is crushed and treated for the production of an aggregate used primarily for road building. There are few materials more abrasive than this slag; ordinary buckets just can't take it without the protection afforded by extremely wear resistant hard-facing. This is true of all types of buckets used by Birmingham Slag Company . . . *special shovel buckets handling the "skulls," clam shells and scoop lifts.*

The pictures here pretty well tell the story. The company uses Stoody 21 liberally as shown in the illustrations to protect teeth, lips, sides and runners. As wear occurs, reapplications of Stoody 21 are made, as necessary, to keep the equipment in top operating condition.

Get complete details on the use of Stoody 21 and other Stoody alloys; you'll find them in the Stoody Guidebook, available from your dealer (consult the yellow pages of your telephone book)—or write to the company.

This latch plate also gets a Stoody 21 treatment to prevent wear.

These Stoody 21 beads across the bucket here resist severe abrasion as it is dragged across the rubble in the slag pit.

The lips on this clam shell are kept in good shape with beads of Stoody 21 for a tight seal.

The scoop lifts handling crushed aggregate lead a rough life; Stoody 21 keeps the lips, sides and bottom in condition. Occasional beads of this material are added as wear occurs

STOODY COMPANY 11948 East Slauson Avenue, Whittier, California

Every advantage for profit in four great M-R-S tractors!

M-R-S POWER TABLE

TRACTOR MODEL	H. P.	SELF-LOAD (C.Y. Struck)	PUSH-LOAD (C.Y. Struck)
200	335	18	30
190	288	14	25
150	250	12	20
125	210	10	17

Wooldridge-M-R-S Scrapers*
FOR USE WITH M-R-S TRACTORS

MODEL	STRUCK Cubic Yards	HEAPED Cubic Yards
OS- 80-B	8.4	10.5
OS- 90-B	12.2	15
OS-151-B	15.1	18
OS-200-B	20	26
OS-260-B	26	32.5
OS-300-B	30	41

*Manufactured by Wooldridge Manufacturing Division, Continental Copper and Steel Industries, Incorporated, Sunnyvale, California.

IT MAKES SENSE in the earthmoving business just as in any other to take instant advantage of an opportunity for increasing production . . . decreasing costs. M-R-S tractors give you this opportunity! Whatever the job, from small connecting roads to the largest turnpike systems, M - R - S tractors and teammate WOOLDRIDGE—M-R-S scrapers provide unparalleled power and capacity for moving dirt fast . . . efficiently . . . and therefore, economically. Whether your requirements call for the 210 H.P. M-R-S 125 or the powerful 335 H.P. M-R-S 200, you'll find that your M-R-S tractor can enable you to be the successful bidder and still retain a comfortable profit margin.

See your nearest M-R-S dealer!

FOREIGN DEALERSHIPS AVAILABLE

HIGHER CAPACITY

Rugged M-R-S tractors power larger scrapers (up to 30 C.Y. struck) to deliver more cubic yards in production per hour. This means greater efficiency and more profits for you because of:

1. Fewer units needed to do the job.
2. Less fuel, maintenance, payroll and overhead costs.
3. Lower initial investment per cubic yard of scraper capacity.

You can realize further savings by using M-R-S tractors to power any large, four-wheel scrapers you may already own.

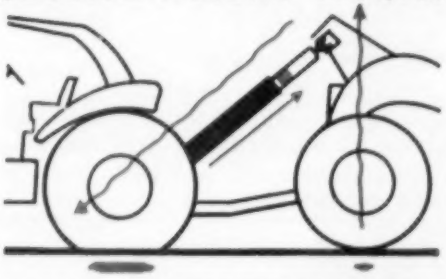
GREATER PRODUCTION

M-R-S tractors provide higher drawbar effort for bigger payloads each trip; faster usable speeds for more cycles per shift; greater maneuverability for saving time in close spots; and rugged, durable construction for continuous, trouble-free operation. All of this adds up to higher production at lower cost per yard of dirt moved.

UNMATCHED VERSATILITY

You're not tied down with M-R-S tractors because they're not permanently attached to any one piece of equipment. They can be switched easily from scraper to sheepfoot roller, construction ripper, machinery trailer or to any of the other important construction tools.

EXCLUSIVE WEIGHT TRANSFER



Patented, hydraulic M-R-S Weight Transfer is the secret of the unmatched performance of M-R-S tractors. The illustration above shows how Weight Transfer shifts part of the scraper load to the soft, low-pressure tractor drive tires, giving greater ground contact area and higher effective drawbar effort. M-R-S tractors equipped with exclusive Weight Transfer assist the push tractor in getting heaping, compact payloads in less time for shorter cycles and more trips to the fill per hour.

For greater profits . . . investigate M-R-S before you invest!

THE EMBLEM OF DEPENDABILITY

M-R-S MANUFACTURING COMPANY

FLORA, MISSISSIPPI

News . . .

Continued from page 46

the progress GM has made in the diesel, aircraft and heavy equipment divisions. Featured will be GM's dump trucks, locomotives, scrapers, tractors, boats and other engines and equipment. Some of the equipment will be demonstrated in action. Some will perform in a big stage show GM has planned.

"Our aim in the Powerama," said Harlow H. Curtice, GM president, "is to unfold the seldom-heard but truly exciting story of how relative new comers on the industrial power scene—diesel and gas turbine engines—are giving the nation new muscles to build its roads, cut its timber, drill its wells, clear and plow its fields, propel its ships and aircraft, drive its trains and turn the wheels of its machines."

A lightweight, low-cost passenger train, designed and built by GM at the request of a committee of railroad presidents, will be introduced at the exposition.

GM's XP-21 Firebird, first gas turbine automobile built and tested in this country, and seven experimental cars and an experimental truck, also will be exhibited.

The following GM divisions will present exhibits: Allison, Cleveland Diesel, Detroit Diesel, Diesel Equipment, Electro-Motive, Euclid, Fabricast, Frigidaire and GMC Truck & Coach.

Mile-Long Canal Dug

A canal, one mile long, 18 ft. deep and from 60 to 200 ft. wide, had to be excavated by the Perine Construction Co. to obtain 330,000 cubic yards of fill for residential development near Fort Lauderdale, Fla.

The 93-acre area, owned by Albert Warner of Warner Bros. movie studios, was subdivided into streets and sites. One section of 102 home sites is surrounded by water. A precast concrete bridge is the lone access.

The Oakland Park Canal, part of the drainage system from the Florida Everglades to the Atlantic Ocean, borders the project on the north. The north fork of the Middle River forms the southeast boundary.

Drilling Symposium Set

A fourth annual drilling symposium will be presented by the University of Minnesota Oct. 13-15 at the Center for Continuation Study on the Minneapolis campus. The use of tungsten carbide in rotary exploration drilling is the subject to be treated at the symposium.

The general program schedule follows:

Oct. 13—1, The Metallurgy of Tungsten Carbide; 2, The Mounting or Arrangement of Tungsten Carbide in Bits.

Oct. 14—3, Experience of Rotary Drillers with Tungsten Carbide in Bits, (a) United States and (b) Other; 4, Combined use of Rotary and Percussion Methods with Tungsten Carbide Bits.

Oct. 15—5, General Discussion.

The Oct. 14 program will include reports from continental European rotary drilling experts on their experiences.

Inquiries and applications for registration should be directed to the Director, Center for Continuation Study, University of Minnesota, Minneapolis 14.

An International Drott TD-9 Skid-Shovel dumps a load of dirt during excavation and foundation work on $900,000 addition to the Queen Anne high school in Seattle.

Cracked Distillates Used

"Cracked distillates" or "recycle stocks," materials considered refinery by-products for years, are being used increasingly today in the production of standard diesel fuels.

This was noted by Dr. L. A. Blanc, associate director of research at the Caterpillar Tractor Co., Peoria, Ill., in a paper he prepared for the World Petroleum Congress at Rome, Italy, in June.

Dr. Blanc said that, if certain requirements are met, the cracked distillates could be used in Caterpillar diesel engines without harm to the engines.

He said that Caterpillar research engineers began in 1939 to investigate possible uses of recycle stock. They believed it could be used because Cat engines always had been made to use West Coast crudes with a low cetane number similar to cracked distillates.

A similar investigation was started by the petroleum industry at about the same time as Caterpillar's.

Caterpillar research observed and solved the following four problems: 1, the formation of gummy conditions in storage; 2, flow and spray characteristics necessary for use in high pressure diesel fuel injection systems; 3, cetane numbers high enough to permit proper combustion; and 4, careful attention to lubricating oil and oil changes.

The researchers found that the fuel met required standards for Cat engines or could be bolstered easily with additives by the refiners.

Dr. Blanc said that the use of cracked distillate fuels were made the more practical because of the advances in lubricating oils, which already have been made to deal with sulphur in diesel fuel.

Louisiana Engineer Retires

Norman E. Lant, Urban Engineer of the Louisiana Department of Highways, retired in July after 32 years of service with the department.

During the last three decades Lant designed or supervised the design and construction of nearly all of Louisiana's major highway bridges.

Equipment

Hough, are "pry-out" bucket action;

Model D *Standard* (GASOLINE ENGINE)

STANDARD EQUIPMENT: Six-volt electrical system, two headlights, one rear and stop light, muffler, 10-ft by ⅝-in. moldboard, hydraulic controls for moldboard lift, four 7.50-20 rear and two 6.50-16 front tires with tubes.

Total weight	8,800 lb	Blade pressure	4,900 lb
Wt. on front wheels	2,700 lb	Four speeds forward to	25.6 mph
Wt. on rear wheels	6,100 lb	Reverse to	3.3 mph

Model D *Special* (GASOLINE ENGINE)

FULLY EQUIPPED AS FOLLOWS: Six-volt electrical system, two headlights, one rear and stop light, muffler, 10-ft by ⅝-in. hydraulically shiftable moldboard, 6-valve control group, four 8.25-20 rear and two 8.25-20 front tires with tubes, front wheel lean, power circle turn, hydraulic scarifier, all-steel cab.

Total weight	10,900 lb	Blade pressure	6,450 lb
Wt. on front wheels	3,750 lb	Scarifier pressure	4,900 lb
Wt. on rear wheels	7,150 lb	Four speeds forward to	25.6 mph
		Reverse to	3.3 mph

Match your grading needs with new economy and efficiency

From the Allis-Chalmers Model D motor grader line

Both gasoline and diesel Model D's are available with any combination of accessories.

Model D Diesel *Standard*

STANDARD EQUIPMENT: Twelve-volt electrical system, two headlights, one rear and stop light, muffler, 10-ft by ⅝-in. moldboard, hydraulic moldboard lift controls, four 7.50-20 rear and two 6.50-16 front tires with tubes.

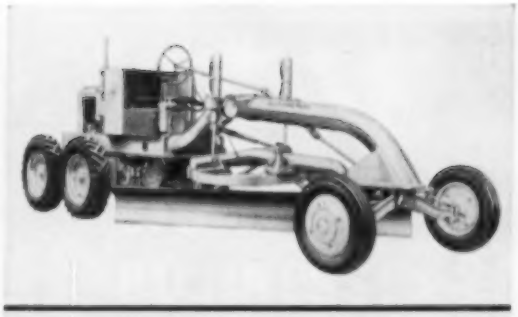
Total weight	9,350 lb	Blade pressure	4,900 lb
Wt. on front wheels	2,760 lb	Four speeds forward to	25.2 mph
Wt. on rear wheels	6,590 lb	Reverse to	3.2 mph

Model D Diesel *Special*

FULLY EQUIPPED AS FOLLOWS: Twelve-volt electrical system, two headlights, one rear and stop light, muffler, 10-ft by ⅝-in. hydraulic shiftable moldboard, 6-valve control group, four 8.25-20 rear and two 8.25-20 front tires with tubes, front wheel lean, power circle turn, hydraulic scarifier, all-steel cab.

Total weight	11,450 lb	Blade pressure	6,450 lb
Wt. on front wheels	3,750 lb	Scarifier pressure	4,900 lb
Wt. on rear wheels	7,700 lb	Four speeds forward to	25.2 mph
		Reverse to	3.2 mph

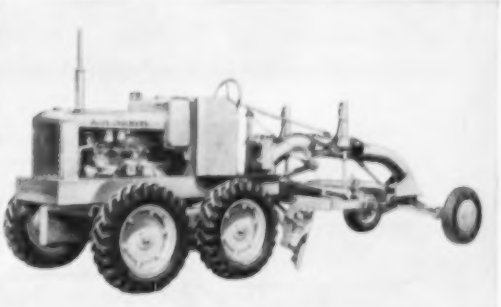
You can still buy a model D for one-third the cost of a large motor grader, and it's the most popular, most versatile small grader on the market. In addition to the units illustrated, the Model D is available with other combinations of accessories . . . or with any of these useful attachments: rear-mounted ⅝-cu-yd loader; shoulder maintainer; one-pass windrow eliminator; V or blade-type snowplows. Ask your nearby Allis-Chalmers dealer for a demonstration . . . and prove the Model D's value.



NOW AVAILABLE WITH YOUR CHOICE OF TWO OUTSTANDING ALLIS-CHALMERS ENGINES

50 - hp POWER-CRATER gasoline engine

50 - hp diesel engine with follow-through combustion



POWER-CRATER is an Allis-Chalmers trademark

ALLIS-CHALMERS

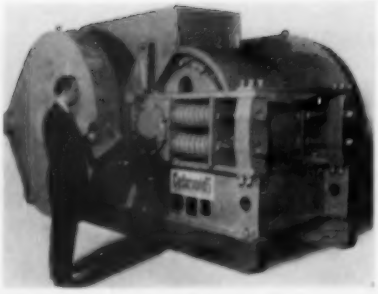
TRACTOR DIVISION · MILWAUKEE 1, U. S. A.

Equipment You Ought to Know About

Iowa Roll Crusher

Manufacturer: Iowa Mfg. Co., Cedar Rapids, Iowa.

Claims: A roller bearing roll crusher, 55 x 30 in., has been announced by the manufacturer. It can be used for any secondary crushing operation where a roll crusher is applicable. With its wider roll shells, the machine's capacity ranges up to 520 tons per hour, depending upon size of finished product desired and characteristics of the material. Maximum finished size is 5 inches and minimum is ¼ inch. The finger timing gears are of chrome molybdenum steel. The Model



5530 can be equipped with two smooth roll shells, two corrugated ones or one of each. Safety shear plates protect the crusher against tramp iron or uncrushable material. The opening between the rolls can be adjusted by inserting or removing shims in a slot on top of the frame.

Hough HO Payloader

Manufacturer: Frank G. Hough Co., Libertyville, Ill.

Claims: The manufacturer has added the third—and largest—four-wheel-drive tractor-shovel to the Payloader line. It is the model HO, which has a capacity of two cubic yards. It is similar in styling and outward appearance to the 1 and 1½-yd. models, HU and HH, which were introduced recently.

Features of the HO, according to Hough, are "pry-out" bucket action; 40% breakout at ground level, and new standards of safety and stability.

The HO has a newly-developed complete power-shift transmission. All shifts through all speed ranges in both forward and reverse can be made without coming to a stop or slowing down.

Pry-out bucket action is accomplished by using breakout pads on the ground as a fulcrum for leverage. Opposing load forces are transferred to the ground through the pads during the breakout, instead of to the axles, wheels and hydraulic system. The 40 degrees of bucket

breakout at ground level permits retaining larger heaped loads.

Underslung design and position of the boom-arm adds to driver safety and visibility.

The adjustable driver's seat is of molded foam-rubber, as are the back cushions.

Other features of the HO, says Hough, are: sealed, pressure-controlled hydraulic system; 12-volt battery system on the gas powered model with battery box and hydraulic oil reservoir mounted behind driver's seat; torque converter; double-acting hydraulic rams with chrome-plated piston rods; and vacuum-boosted, 4-wheel hydraulic brakes and power steering. A load-shock accumulator device is optional.

All-Purpose Brush Cutter

Manufacturer: Homelite Corp., Port Chester, N. Y.

Claims: The manufacturer has announced an attachment that converts its Homelite Model 17 chain saw into an all-purpose brush cutter.

The brush cutter was designed primarily for use by land clearing contractors, road crews, pipe line companies, railroads and utilities and park and forestry departments. It has a friction-free, flexible shaft which delivers 3.5 brake hp to the 10 in. circular blade. Hanger and handle bars are adjustable. A special harness distributes the weight of the entire unit on both shoulders.

A diaphragm-type carburetor permits

Hydrocrane Changes Boom Length

cutting in any position. The arm is five feet long. The Homelite saw collar guards against binding by weeds, leaves or twigs.

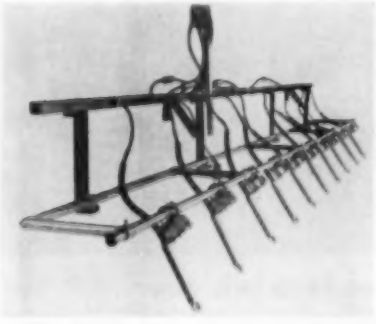
Concrete Vibrator Attachment

Manufacturer: Maginniss Power Tool Co., Mansfield, Ohio.

Claims: An electric full-slab paving vibrator attachment, suitable for mounting on concrete spreaders and finishers for use in the construction of airport runways, aprons and highway pavements, has been introduced by the manufacturer.

Capable of vibrating full slabs as much as 25 feet wide to depths of 19 inches with Model HFSV-3 vibrators and thinner slabs with the Model HPV-3 vibrators, the attachment mounts directly on the spreader or finisher. It consists of a lightweight, sectional steel frame on which up to 10 spring-suspended Model HFSV-3 or HPV-3 concrete vibrators are mounted. No auxiliary carriage is required, says the manufacturer.

The frame and vibrators are raised, lowered and positioned by double-acting



hydraulic cylinders mounted on adjustable brackets. A four-way, three-position valve connected to the spreader or finisher's hydraulic system controls the cylinders. Vibrators are activated by a

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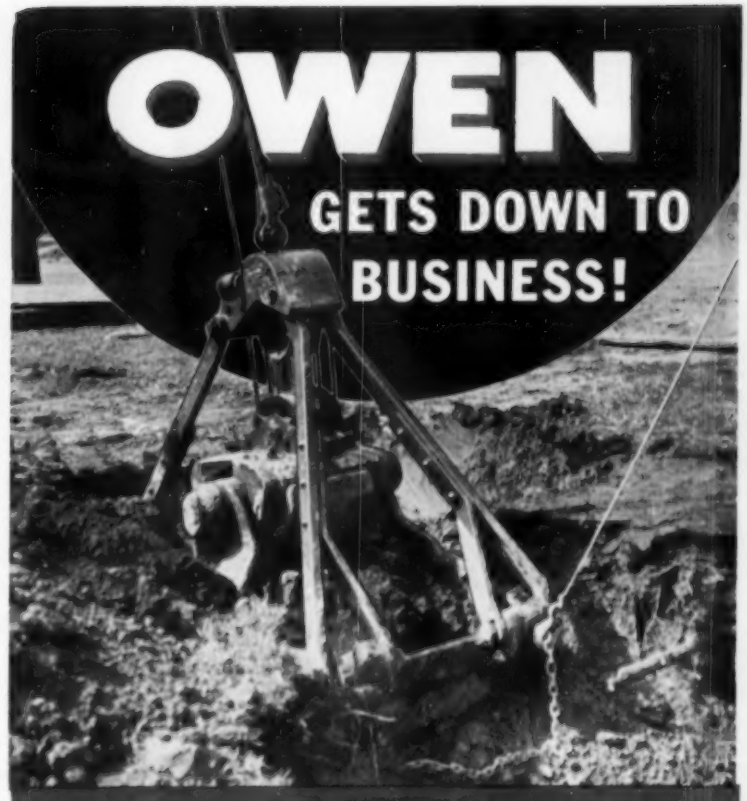
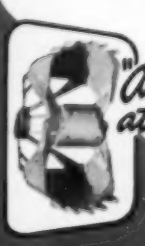


...down into capacity loads at rapid digging speeds

Owen buckets get "down to business" because they are designed and built for just that purpose. Low center of gravity...teeth made and positioned for deeper penetration...more rugged lip, shell and arm construction...full balanced digging power on each jaw of bowl...all these Owen features assure a maximum load at every bite.

Write today or ask your dealer for the latest Owen bucket catalog giving full details on all sizes and models.



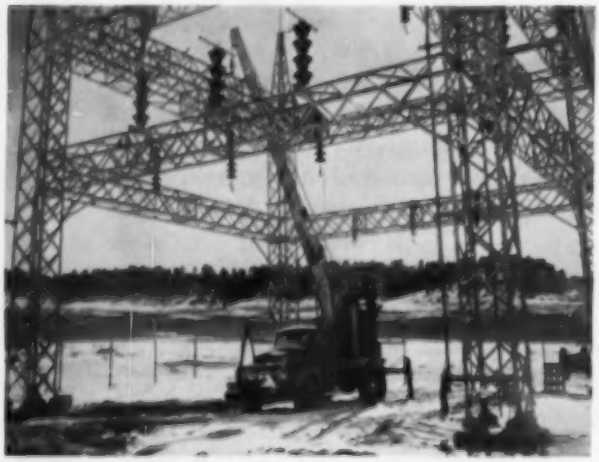
OWEN CLAMSHELL BUCKETS
BIGGER DAYS WORK

THE OWEN BUCKET CO.
6095 Breakwater Avenue • Cleveland 2, Ohio
Branches: New York, Philadelphia, Chicago, Berkeley, Calif., Fort Lauderdale, Fla.

Hydrocrane Changes Boom Length While It Works— Lets You Cash in on the Impossible Jobs

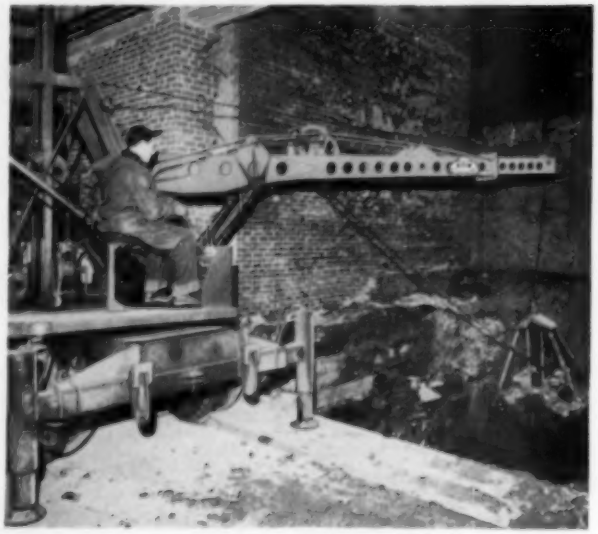
Eight feet of *extra* boom at your finger tip — that's the job-multiplying, time-saving advantage you get with a Bucyrus-Erie Hydrocrane. Telescoping section extends or retracts hydraulically — either *while boom is stationary or during boom hoist or line hoist.* With this outstanding feature operators have easily maneuvered loads in and out of quarters so cramped an ordinary crane wouldn't even get close.

These on-the-job pictures show a few of the spots where the Hydrocrane's telescoping boom made the difference — a difference your Bucyrus-Erie distributor will be happy to demonstrate right on your own job. It's something you must *see* to fully realize what it can do for you. 55H55C



Extra reach meant extra speed on sub-station erection

This sub-station went up in a hurry with the combination of independent boom hoist, boom telescope, and the extra reach provided by the optional boom extension section. This steps up reach to 38 feet. Precision hydraulic control provided extra safe handling of fragile insulators. Telescoping boom poked in and out of framework while outriggers anchored crane solidly to the ground. Fifty mph travel speed saved time to and from job.



Crane couldn't move closer— but the boom did!

This indoor excavation job is an excellent example of the versatile Hydrocrane boom in action. By reaching out to the far edges, the boom brought the entire area within reach of the clamshell — saved hours of costly hand labor. Boom had to be retracted during each swing cycle so as to clear building wall for dumping.

Sticks its nose into windows

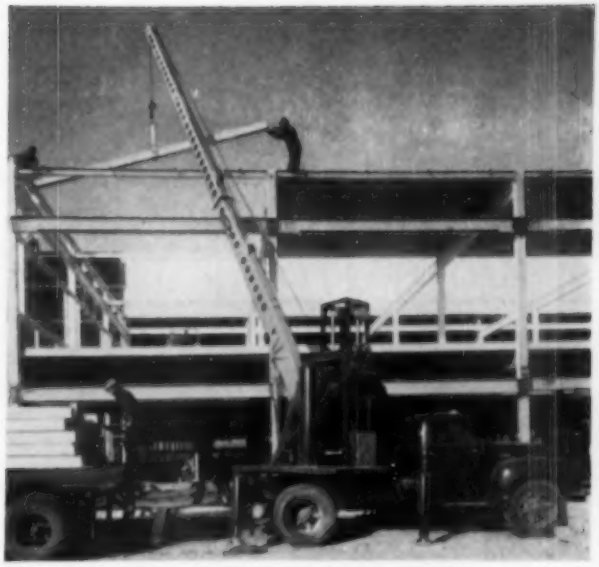
Here the Hydrocrane noses a steel beam into a window on a remodeling job. No need to jockey truck back and forth — telescoping boom turned the trick, smooth and quick. In fact, it was smooth all the way because every crane function — boom hoist, line hoist, swing, outrigger set and retract — operates through cushioned hydraulic power.

Boom tucked in for travel

Ability to slip in and out of crowded city traffic is almost a Hydrocrane trademark — and again credit the boom telescope. Boom is fully retracted and fits snugly over cab, resting securely on a strong bracket. And on open highways the Hydrocrane skims along at speeds up to 50 mph. Note, also, the power unit mounted on the upper deck. This engine powers the hydraulic system (power take-off from truck engine optional), with all engine controls conveniently located at operator's station.

Stopped by a wall— but saved by a boom!

Retaining wall prevented crane from maneuvering closer on this drainage trench job — but the boom simply reached out and handled the digging in short order. Clamshell closes by hydraulic power — provides effective bite at any angle. Note, too, that with telescoping boom both truck and crane can remain stationary. Operator merely raises and simultaneously telescopes boom to get bucket into dumping position.



"We'll take the Hydrocrane" say the pre-cast men

Jobs by the hundreds — thousands of feet of pre-cast concrete slabs smoothly and quickly installed — that's the story all over the country of pre-cast operators and their Hydrocranes. And owners report much of the credit for the successes of Hydrocranes in this work is the telescoping boom in combination with independent boom hoist. Its ability to slip in between girders—over walls—into windows—has been a big factor in setting 8,000 sq. ft. of concrete planking — and better — in a single day.

Boom telescope for Hydrohoe, too

Ability to extend and retract hoe boom is a big asset for the Hydrohoe, too. This feature, in conjunction with wrist-action dipper, provides a unique crowding force making it possible to undercut effectively and dig trenches deeper than they are long with vertical walls and level floor. Hoe is quickly convertible to crane boom in the field.

BUCYRUS ERIE

South Milwaukee, Wisconsin

"Sneak Down the Side Roads You May Be Over the Weight Limit — "

"Everything We Build We Build Solid!"

"My Horn Isn't Working"

"He's Lived In Dread the Trend Would Hit Us."

"I Hear They've Installed Closed Circuit Television on This Job — What the Devil For, Huh?"

"Not Many Men Your Age Have Reached Your Age in This Business, Eh?"

"We Doubled Blade Life

DRAG ROPE LIFE INCREASED 25%

says Correale Construction Company
HAZLETON, PENNSYLVANIA

ESCO LONG BOWL SOCKET GRIPS ALL 6 STRANDS to make rope last longer!

Correale Construction Company operates a *1150-B* Bucyrus-Erie dragline with a 180 ft. boom at a stripping operation near Minersville, Penn. Here are their records on 2½" by 290' ropes, 6 x 19—"W"—I.P.S.—I.W.R.C.:

From January 1947 until April 1951 each set of ropes averages 926,000 yards. *Since installing ESCO Long Bowl Sockets in April, rope life has increased to 1,166,000 yards*—about 25%. This is a savings of approximately $500 for each set of ropes or a total of $5000 on the ten sets replaced since April 1951.

ESCO Long Bowl Sockets Can Reduce Costs on Your Job. See your *ESCO* Dealer or write direct.

This is a cutaway view of an ESCO Long Bowl Socket showing grip on six strands.

Compare to conventional socket which grips three strands.

SEND FOR THIS FREE BOOKLET

Here's your guide to lower maintenance costs on any dragline.

Send for your copy today.

ESCO ELECTRIC STEEL FOUNDRY COMPANY
2143 N. W. 25th Avenue, Portland, Oregon
Send me a free copy of catalog:
"Replacement Parts For Any Dragline"

Name _____

Company _____

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...JUST ONE MORE REASON WHY YOU SHOULD INSIST ON

ESCO

REPLACEMENT PARTS

FOR ANY MAKE OR MODEL OF DRAGLINE BUCKET

"We Doubled Blade Life ...Stopped Blade Breakage"

said C. B. Hewitt, President,
Hewitt Contracting Company, Columbus, Georgia

"...and that's why we standardized on ESCO Alloy 12M Scraper Blades"

"Rolled steel blades were giving us a rough time," said Clyde Hewitt, President, Hewitt Contracting Co. "They were wearing out fast and costing us plenty in breakage downtime. When we switched to Esco Cast 12 M Blades on one job blade life more than doubled and blade breakage stopped entirely. Can you blame us for standardizing on Esco Blades?"

ESCO Blades last longer because they are cast of *ESCO* 12M—a special Alloy steel metallurgically-engineered by *ESCO* to resist the impact and abrasion of scraper operation.

See your *ESCO* Dealer or write for cost-reducing details.

FOR LONGER BLADE LIFE ALWAYS ASK FOR...

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Los Angeles, San Francisco, California
Seattle, Spokane, Washington, Eugene, Oregon
Centralia, Pennsylvania, Houston, Texas
Salt Lake City, Utah; Honolulu, Hawaii

In Canada, Vancouver, B.C., and Toronto, Ont.

New Equipment . . .

Continued from page 53

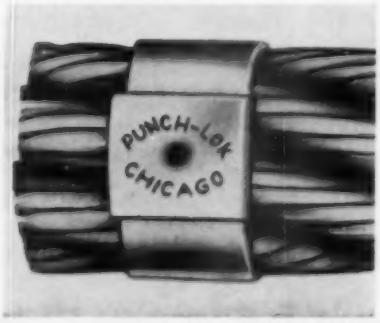
switch located within easy reach of the spreader operator.

Both model vibrators operate on 180-cycle, 120-volt, 3-phase current. Similar in design and construction to standard hi-lectric vibrators, they are spring mounted on brackets. Model HFSV-3 is mounted for near-vertical immersion in the concrete. Model HPV-3 is mounted for horizontal immersion. Both vibrators operate with heads completely submerged. Maginniss Hi-lectric vibrators produce low amplitude vibrations, with frequencies from 5,000 to 10,000 rpm obtainable by regulating generator speed.

Power to operate 10 vibrators is supplied by an 18.7 KVA generator with built-in exciter and voltage regulator of the magnetic amplifier type. Initial excitation is furnished by a 6-volt battery. The generator is driven by a 4-cylinder, liquid-cooled engine operating at 1,800 rpm. Electrical starting is available. The engine and generator are skid mounted for easy installation on any spreader or finisher. The manufacturer also offers other sizes of generators for applications where fewer vibrators are required. Individual receptacles for vibrator cables are enclosed in a sectional box conduit mounted on the spreader or finisher.

The attachment is furnished as a complete package consisting of frame, brackets, vibrators, hydraulic cylinders, valve and piping, conduits, control switch, cables, engine-generator, plus necessary mounting hardware.

Wire Rope Clamps



Manufacturer: Punch-Lok Co., Chicago, Ill.

Claims: The manufacturer is producing Punch-Lok hose clamps. Seizing wire rope with hose clamps prevents movement of the strands during the cutting operation, says Punch-Lok. Only one clamp is needed on each side of the cut on stress-free preformed rope. Clamps then can be removed or left as a permanent seize.

Aerial Photograph Viewer

Manufacturer: Meyer-Opticraft, Inc., New York, N. Y.

Claims: The manufacturer has announced a new line of photogrammetric stereoscopes and rangefinders for aerial survey work in the construction industry. The line includes the MS-1 mirror-type stereoscope with accessory binoculars for viewing 9 by 9 in. aerial photographs in three dimensions. The instrument stands 8 inches high.

Ready-Mix Concrete Carrier

Manufacturer: Oshkosh Motor Truck, Inc., Oshkosh, Wis.

Claims: The manufacturer has marketed a 4-wheel drive ready-mixed concrete carrier, designed to carry a payload of 18,000 pounds on each axle. The entire engine is cantilevered forward of the front wheels.

The Oshkosh 50-50 concrete carrier was engineered and built specifically for the ready-mixed concrete industry. It hauls up to five cubic yards legally, depending on the mixer selected, with sufficient water for ready-mixed concrete

operation. The 4-wheel drive feature provides traction for spotting loads where they are wanted.

The 50-50 has a 144 in. wheel base and is equipped with Vickers power steering which acts directly with only one drag link.

The 50-50 has a Continental 141-hp engine. The exposed power steering unit and the horizontally mounted differential units may be serviced without removing the mixer from the chassis. Oshkosh standard parts are used throughout.

Front wheels have 14:00/20, 18-ply single tires. The front axle is a double reduction, full floating axle with alloy steel, heat-treated shafts designed to carry 18,000 lbs., or 50% of the gross load, and provide practically the same flotation on the front as the four 10:00/20-12 ply tires do on the rear. The rear axle is a single reduction, full

Continued on page 62

"I'll see that you get your raise—just don't raise a stink!"

NOT in the Contract

Henpeck, in a battered state, was being cross-examined by a bullying counsel. "Do you mean that you have always treated your wife with respect?" asked counsel.

"Always," replied Henpeck firmly.

"And you've never once spoken a hasty word to her?" Henpeck hesitated for a moment and the lawyer roared, "I want the truth!"

"Well," faltered Henpeck, "I remember I did once say to her, 'put down that poker!' "

A local lassie announces a household tragedy. Yesterday she opened a bag to get her bathing suit. She inspected it and found nothing but three moths in the bag, all dead from malnutrition.

Sambo was hired on a construction gang. At the close of the first shift he was exhausted and sought the boss.

"Mister, yo' sho yo' got me down right on the pay roll?"

"Sure," said the boss. "Heres your name—Sambo Simpson. That right?"

"Yes, suh," replied Sambo, "Ah just thought you might have me down as Samson."

The barkeep kept a pet parrot. A drunk spotted it, climbed atop a stool and tried to catch it.

"Scram, landlubber," shrieked the outraged parrot. "What's the big idea?"

The surprised drunk tipped his hat and mumbled, "I'm sorry, mister. I thought you was a boid."

"This will give you a slight idea how my scraper operates."

A Texas contractor, newly arrived in England, was playing poker with a couple of the natives. He was pleasantly surprised when he drew an early hand containing four aces.

"I'll wager a pound," said the Britisher on his right.

"Ah don't know how y'all measure your money," drawled the Texan, "but Ah reckon Ah'll have to raise you about a ton."

Pablo, the little Mexican schoolboy, was asked by his teacher:

"Pablo, what does your father do?"

"I have no father. He was killed by the weasel."

"Killed by a weasel?" the teacher echoed. "How could that be?"

"He was seeting on the railroad track," Pablo explained patiently, "and he deed not hear the weasel!"

During a grouse hunt two shovel operators were shooting at a clump of trees near a stone wall. Suddenly a red face popped up over the wall.

"Hey, you almost hit my wife!"

"Did I?" cried the other aghast. "I'm terribly sorry—have a shot at mine over there."

Science professor: "What happens when a body is immersed in water?"

Brilliant Co-ed: "The telephone rings."

In an essay on "things I am thankful for," the little son of a contractor listed "my glasses," explaining: "They keep the boys from fighting me and the girls from kissing me."

The traveler rushed up to the station window and gasped, "Give me a round-trip ticket, quick."

"Where to?" asked the agent.

"Back here, you dope."

A customer, "dead wrong," lay on the icy slab at the morgue.

The detective from the homicide squad ended his report on a cryptic note. "There were powder marks on his body before and after she shot him."

A young bride of three months complained to her relatives about her husband's continued drinking habits.

"If you knew he drank, why did you marry him?" she was asked.

"I didn't know he drank," she replied, "until one night he came home sober."

Down time can upset *any* schedule. Best way to avoid it is to insist on genuine CAT* parts every time. Then you're sure of getting parts that are made to the latest design, precisely manufactured of the right materials, rigidly inspected and tested.

Take track shoes, for example

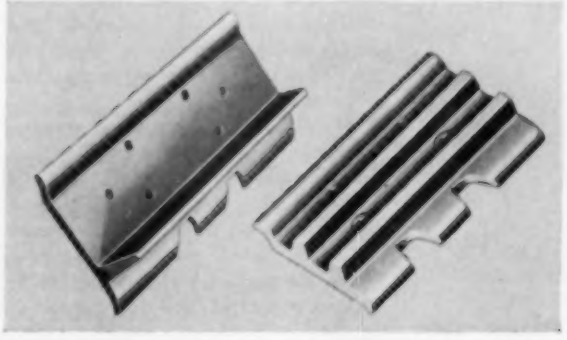
"If the shoe fits, put it on," can often be bad advice. Other makes of track shoes may *fit* all right, but how will they *wear?* It took years of research and field testing to develop Caterpillar's exclusive hardening process which makes genuine Cat shoes wear up to 75% longer than most others. The Cat shoes pictured here (a standard shoe, and a double grouser shoe for roughest rock conditions) are made of specially rolled high-quality steel sections—with a yield strength of 100,000 lbs. per square inch. With a substitute track shoe: who can be sure?

The difference on the job: with genuine Caterpillar-built track shoes you can count on longer work life, there's less replacement, and you get better performance under any working conditions.

With substitute parts: who can be sure?

Better get genuine Caterpillar parts every time.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



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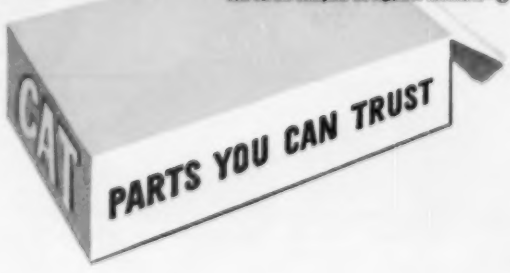


New Equipment . . .

Continued from page 59

floating hypoid axle with alloy steel heat-treated shafts.

The chassis lends itself to applications other than ready-mixed concrete carrier use, says Oshkosh.

IH TD-18A Crawler

Manufacturer: International Harvester Co., Chicago, Ill.

Claims: Increased in horsepower, the TD-18A diesel crawler tractor now is being produced by the manufacturer.

Power in the TD-18A has been increased to 103 drawbar horsepower. The drawbar pull is 24,300 pounds at rated governed speed of 1,450 rpm.

The TD-18A has six forward and two reverse transmission speeds, ranging from 1.6 to 5.5 mph.

Track frames have been strengthened. They have machined surfaces at the

points where track frame pivot brackets, front idler support assemblies, track spring retainers and equalizer spring guides are attached. Diagonal braces are line reamed and doweled. Track frames are kept from tilting by heavy steel arms that connect the frames with the pivot shaft by special bearings.

The crawler has an adjustable, truck-type operator's seat, 3½ inches deep. It is 18 7/16 inches wider than the seat in the former model. The seat is padded with foam rubber. The operator's compartment has been streamlined and made roomier. Steel fenders have been installed. The three-section floor is now flush with the fenders.

Self energizing brakes are a new feature. There is a brake pedal for each track.

Control levers are compactly arranged, says IH. Steering levers and the master clutch lever are located on the left side. An improved engine-starting change-over lever is operated with the left foot. A ratchet-type throttle is situated on the dash. The gear shift and forward and reverse levers are on the right.

The hydraulic booster pump always runs and does not depend on master clutch engagement. Each steering clutch has its own individual pump.

Fuel tank capacity of the TD-18A has been increased to 75 gallons.

The TD-18A is the second most powerful crawler on the International team. It has a 12-volt electric starting and lighting system, including starting motor, generator, batteries, two headlights and one rear light. It has a built-in gasoline conversion system.

The tractor is 158¼ inches long and 96 inches wide with 22-in. shoes. It comes with regular or extended track frame. Operating weight with regular frame is 24,585 pounds; with extended frame, 25,605 pounds.

"Miss Hoskins, just where did you send our order for new dragline buckets?"

Rubber-Tired Tractors

Manufacturer: Caterpillar Tractor Co., Peoria, Ill.

Claims: The manufacturer has made two additions to the Cat rubber-tired tractor line—the DW21 (Series C) and the DW20 (Series E). Both have more horsepower and are of different design than the current models of the DW21 and DW20.

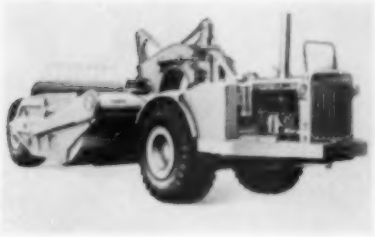
The new diesel engine for the tractors is rated at 300 hp at 1,800 rpm. Piston displacement is 805 cubic inches. The six cylinder, 5⅛ x 6½ in. diesel engine is turbocharged. The turbocharger is driven by the engine's exhaust.

Among new design features of the diesel engine are a new block, crankshaft, connecting rods, pistons and head.

The engine utilizes new paper type fuel filters. The fuel system has been redesigned.

Wide base 29.5-29 tires are standard equipment (in rock-type tread) on the new tractors.

Either direct electric starting or gasoline starting on the two new tractors is available. Speeds for the DW20 range from 2.8 to 32.1 mph; on the DW21, 2.3 to 20.5 mph. Full-flow filters have



been engineered into the hydraulic steering system. Brake controls have been improved with roto-chambers.

Caterpillar has designed two new matching scraper units for the tractors —the No. 456 for the DW20 and the No. 470 for the DW21. The scrapers have the Caterpillar "lowbowl" design.

A high lift apron has been developed. Higher ground clearance has been built into the scrapers.

The same wide base 29.5-29 tires that appear on the new tractors are standard equipment on the scrapers.

Rubber-Covered Crawler Pads

Manufacturer: Metalweld, Inc., Philadelphia, Pa.

Claims: Rubber-covered crawler pads on paving machines speed up paving operations, says Metalweld. The pads permit movement of pavers over finished concrete without damage to the surface.

The pads are made of steel plates ¼-in. thick and usually about 8-in. wide x 15 in. long, with a covering of pliable rubber on one side. The rubber and steel are joined together by the B. F. Goodrich Vulcalock process. The rubber covering may be from ⅛ to 1 in. thick, depending upon requirements and the clearance on the paver. The pads are attached to the crawlers by four ½-in. diameter carriage bolts through the holes in the crawler shoes, or through specially drilled holes.

Intended for finished roadbeds only, the pads cannot be used where sharp rocks and stones would damage the rubber covering.

B-K Trench Roller

Manufacturer: Blaw-Knox Co., Pittsburgh, Pa.

Claims: The first dual-compression trench roller for road widening jobs, the Model DTR-552, was recently announced by the manufacturer. It was built as a companion piece to the two models of Blaw-Knox road wideners.

The DTR-552 was intended to speed and improve compaction of widened

Continued on page 66

ROGERS TRAILER
Aids to Atomic Research

97 ton atom-smashing coil moved by R. R. Schubert of Butler, Pa. on a Rogers 75 ton capacity I beam trailer.

240,000 lb. synchro-cyclotron was hauled on a 75 ton capacity Rogers I beam trailer.

In this amazing scientific age there is a general inclination to accept progress with little thought as to the vast knowledge, skill and facilities required to attain it.

Take, for example, atomic development. Of basic importance is the scientific research. Next required are the engineering and mechanical operations to translate this knowledge into electrical and mechanical components. Then comes the *problem of moving these heavy, valuable parts to the laboratory.*

Consider the case of the Carnegie Institute's Nuclear Research Laboratory at Saxonburg, Pennsylvania. After a water trip of 3600 miles two expert riggers were engaged to move the atom-smashing coil and synchro-cyclotron from the waterfront to laboratory. Both of them entrusted their precious loads to Rogers Trailers.

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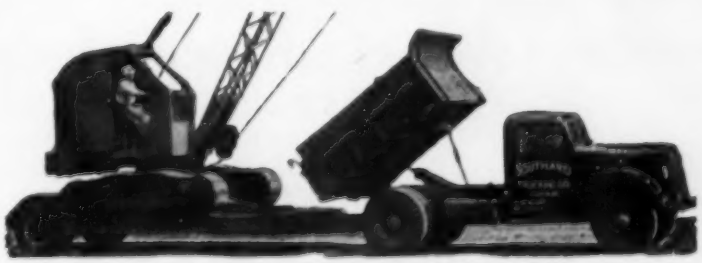

Attaching of loaded Rogers Tagalong trailer

DIGGING or LIFTING . . .

Bucyrus-Erie Operating Features Help Speed Work

Powerful Crowd, Fast Cycles Speed Excavating

A positive crowd action that concentrates maximum digging force at the dipper teeth helps Bucyrus-Erie excavators load fast, even in tough material. Front-end design eliminates deadweight, puts strength where it's needed to withstand digging and swinging stresses.

Smooth-working, instant-acting controls let operators work with an easy rhythm to achieve high-speed dig-swing-dump cycles through an entire shift. Your Bucyrus-Erie shovels stay on the job with far less maintenance, too, because there are fewer working parts to wear out, and Individual Design matches each part to every other.

Accuracy and Stability **Speed Crane Jobs**

The operator of a Bucyrus-Erie crane has finger-tip command over every lift. Full-feel controls and independent boom hoist enable him to maneuver loads easily and with precision, while a wide crawler mounting and low center of gravity provide safe stability for handling heavy lifts. A correct balance of power, strength and weight contribute to best over-all operation. To save time on the job, boom inserts can be added in a matter of minutes, and jibs can be put on without removing guards, sheaves or suspension ropes.

See your nearby Bucyrus-Erie distributor for complete information on cranes and shovels of just the size you need. 174E55C

BUCYRUS ERIE

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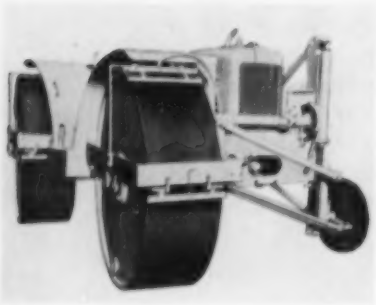
YEARS OF SERVICE to Men Who Shape the Earth

New Equipment . . .

Continued from page 63



road strips. It is equipped with two heavy compression rolls of 60-in. diameter and 20-in. width which will exert a compression per lineal inch of roll face ranging from 250 pounds, without water ballast, to 345 pounds, with water ballast, for each roll.

By changing the position of the rolls, the compaction width of the roller can be set at any width between 20 and 39 inches. This adjustment can be made while the trench roller is moving.

Rolling depth of the DTR-552 reaches up to 24 inches below existing pavement.

The operator is seated between the two rolls. Reversed fan blades in the engine blow hot air and dust away from the operator.

Each compression roll can be steered independently through hydraulic controls which permit the operator to work to the inside radius of a curve without reducing his speed. The compression rolls are synchronized with the two mated leveling wheels, mounted on 7:50 x 10 ten-ply industrial pneumatic tires. Swivel type tie-rods compensate for uneven trench rolling conditions.

Two speeds forward and reverse are provided—a low at 1.62 mph and a high at 5.55.

The engine is a Continental F-226 with 50 brake horsepower at 1,800 rpm and a piston displacement of 226 cubic inches.

Power is transmitted to the wheels through heavy duty chain-driven sprockets.

Each roll has a separate brake, built in with differential. Selective additional traction can be obtained by applying the brakes or by locking either side of the braked differential.

Each roll is equipped with two scrapers and one cocoa mat.

The water supply and sprinkling system is controlled by a 60-gal. water tank and electric pressure pump. The water flow is controlled by foot.

Overall dimensions of the trench roller are: length, 14 ft.; width, 8 ft.; height, 6 ft. The shipping weight is about 15,000 lbs.

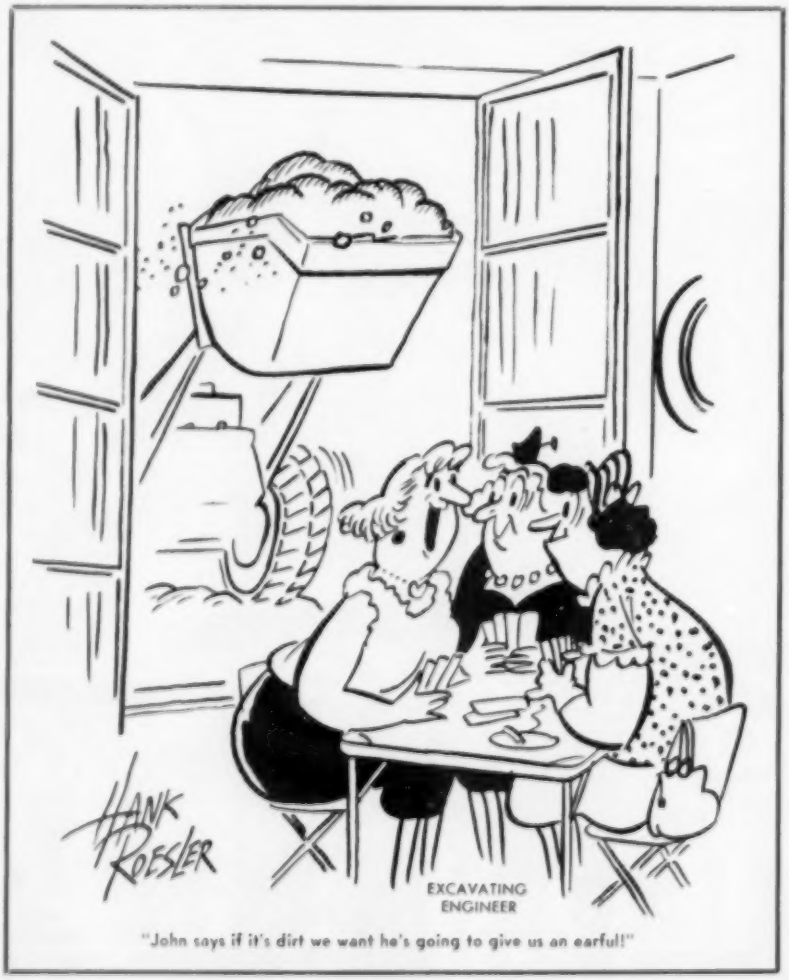
Parsons Trenchliner

Manufacturer: Parsons Co., Newton, Iowa.

Claims: The manufacturer has developed a ladder-type Trenchliner—the Model 155—with reduced weight and dimensions. Compact design, low center of gravity and low ground bearing pressure are additional characteristics of the new unit, says Parsons.

The 155 produces from 5.8 inches to 12.75 lineal feet of trench per minute in a range of 30 speed selections by lever control. A higher range of 30 speeds, up to 25 lineal feet per minute, is made available by a sprocket change. The 155 has a maximum depth capacity of 8 feet and widths from 16 through 26 inches.

Other features of the 155 are: hydraulically actuated boom hoist that incorporates a down crowd; a power shiftable and reversible belt conveyor that discharges spoil to either side and at selective distances from the trench wall; friction-type clutch for bucket line drive that serves as an automatic safety to protect machinery from shock loads; choice of 16, 20, or 24-in. buckets to which oversize adaptors can be fitted to increase trench widths by 2 or 4 inches; Parsons bucket teeth, and a choice of 12 in. flat or 16 in. grouser type tread



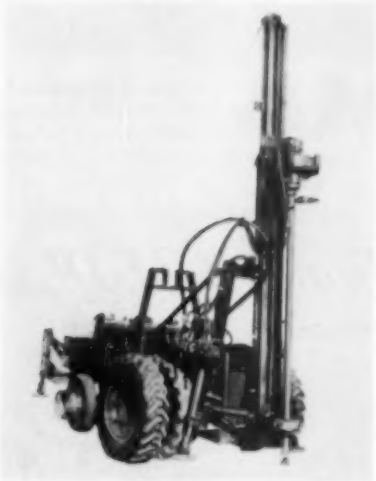
"John says if it's dirt we want he's going to give us an earful!"

on full tractor-type crawler mounting. Either gasoline or diesel power is available.

Portable Drilling Rig

Manufacturer: Schramm, Inc., West Chester, Pa.

Claims: A new-type portable drilling rig, the Schramm Rotadrill on Pneumatractor, has been developed by the manufacturer. The new unit is self-contained, self-propelled and self-powered.



It can drill a 4¼ in. hole to a depth of 500 feet. All controls are arranged in one bank, adjacent to the mast.

Special weight boxes and dual rear-wheels on a 125 cfm heavy pneumatractor provides 10,000 pounds down pressure. Normal compressed air drilling pressures of 20-30 psi can be increased instantly for dewatering or breaking out blockages. The standard rotative head has 75 rpm output and can be throttled down to complete stall while maintaining constant torque.

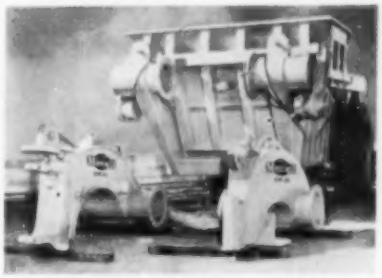
The heavy welded structural steel mast, lowered for traveling between jobs, can be operated at various angles for sloping holes.

C & D Movall Wagons

Manufacturer: C & D Mfg. Co., Perkins, Calif.

Claims: Interchangeable yoke sections to fit Caterpillar DW20 and DW21 and similar prime movers are featured on the C & D Movall power ejection and dump wagons.

Changeover from scrapers to Movalls, or vice versa, can be made by two mechanics in four to eight hours in the field, says C & D. Movalls use exactly the same front end arrangement as the



scraper; no modifications or extra assemblies are required.

The same basic Movall can be used interchangeably with either the Caterpillar DW20 or DW21, or any prime mover with sufficient horsepower and double-drum cable control, by installing the proper gooseneck.

Tracto-Loader Bucket

Manufacturer: Tractomotive Corp., Deerfield, Ill.

Claims: The manufacturer announces a larger bucket with 25° of tip-back at ground level for its TL-10 Tracto-Loader.

Formerly a ¾ cu. yd. unit, the redesigned bucket now has a capacity of a full cubic yard. The width of the bucket

Continued on page 70

Always insist on genuine

BLAW-KNOX REPAIR PARTS

- cut clamshell maintenance costs
- reduce costly downtime
- prolong bucket life

BLAW-KNOX repair parts are especially designed to fit your Blaw-Knox Clamshell. They contain *all* the carefully engineered features of the original parts to assure the efficient operation, low maintenance and long life you expect from Blaw-Knox products.

There's no need to use a costly "mongrel" bucket . . .
always insist on genuine, factory-built repair parts.
Write for a parts book today, if you don't have one,
giving the serial number of your bucket.

Get this "Bucket Saver" booklet

It's the only booklet available with a bucket-saver list of "do's" and dont's on clamshell use and abuse. It illustrates reeving methods that improve bucket performance. It gives complete details on bucket repair. It contains 40 pages of usable information. Write for Bulletin 2373 today!

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MAKE your plans now! The General Motors Powerama will be a national event too important, too spectacular to miss.

On 20 acres of grounds, a World's Fair of Power will unfold wonders galore. Fascinating exhibits—thrilling demonstrations—a colorful stage show—everything to make your visit interesting, educational and well worth the trip.

Come and bring the family. *Admission free!*

Plus many other interesting exhibits you won't want to miss—

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CLEVELAND DIESEL engines powering a submarine you can go aboard and inspect.

ELECTRO-MOTIVE's advanced lightweight 100-mile-an-hour train with its amazing new air-suspension springing.

EUCLID's full line of 10- to 50-ton Diesel trucks and 7- to 18-yd. scrapers.

FABRICAST's exhibit of modern casting methods.

GMC Diesel trucks and coaches, SceniCruiser and spectacular new "L'Universelle."

And a Complete Exhibition of GM's 7 Dazzling Dream Cars:

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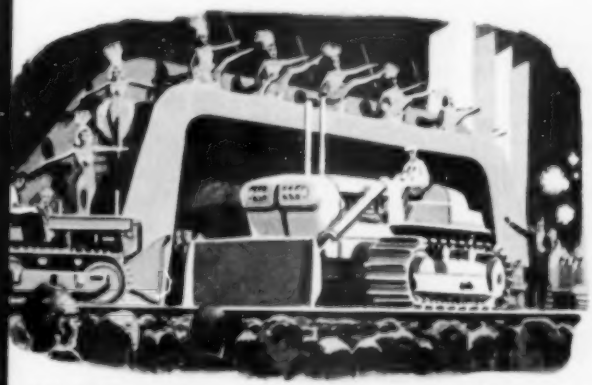
GENERAL MOTORS • DETROIT 28, MICHIGAN

In Canada: General Motors Diesel, Ltd., London, Ontario

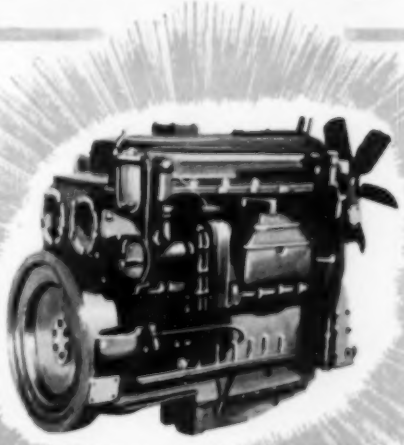


GM Powerama presents—"More Power To You"—a mammoth variety show in which Diesel-powered vehicles perform fantastic maneuvers—with Big Top circus acts and a huge cast of dazzling dancing starlets.

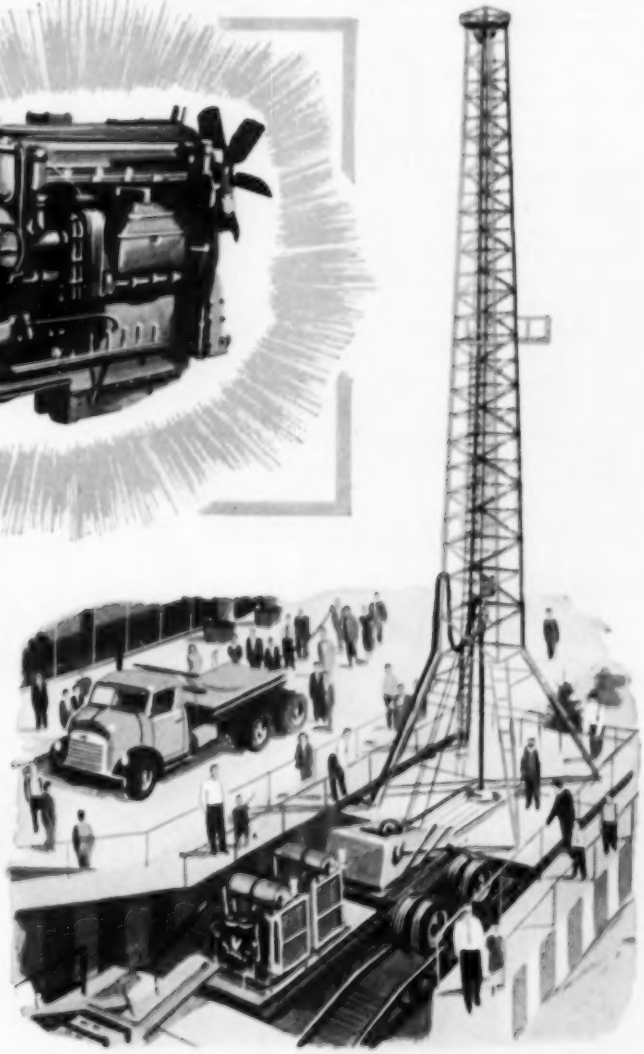
GM Powerama presents—a wide variety of interesting, *operating* exhibits showing the use of Diesel power in many fields including a sawmill, a cotton gin, an irrigation system, a farm tractor and a feed mill.

Horsepower

GM Powerama presents—at the head of the parade—Detroit Diesel's golden "6-71" Diesel engine (representing 100 Millionth General Motors Diesel H.P.). Also, Dr. Diesel's first engine and exhibits ranging from the 1933 World's Fair Diesel engine to the compact new "51" engine that opens new fields for Diesel usefulness.



GM Powerama presents—a marine display including GM Diesel-powered shrimp boat and 36-foot and 22-foot pleasure craft for the interest of those who want Diesel safety, speed and economy in their boats.



GM Powerama presents—a modern, portable oil-well drilling rig in action, powered by General Motors 2-cycle Diesel engines which have won a reputation for "more power in less space with less weight."

New Equipment . . .

Continued from page 67

has been increased by 1½ inches, allowing the bucket to be operated flush against walls and into corners. The machine has a turning radius of 11 feet.

The tip-back action of the TL-10 has been designed to allow the bucket to be independently tipped back as much as 25° at ground level. The automatic tilting action during the raising cycle has been retained so that at the low carrying height of three feet the bucket is tipped back to an angle of 45°.

I-R Air Compressor

Manufacturer: Ingersoll-Rand Co., New York 4, N. Y.

Claims: A 125-hp-electric-driven air compressor has been added to the manufacturer's line of air-cooled two-stage Type 40 stationary compressors.

Some of the features of the new unit, says I-R, are: single-core, horizontal-flow inter-cooler, new shrouding, force-feed lubrication, full free-air unloading and a new version of the Ingersoll-Rand channel valve.

Either constant-speed control or dual control can be furnished. Dual control is available with either automatic or manual selection.

The Type 40 line also includes sizes of 25, 40, 50, 75 and 100 hp.

Clayton Steam Generator

Manufacturer: Clayton Mfg. Co., El Monte, Calif.

Claims: The manufacturer has developed a portable steam generator for construction projects in remote territory.

The Clayton generator can be mounted on a trailer and brought directly to the building site. After hooking up steam and water supply lines, the generator can supply steam under pressure in five minutes, the manufacturer claims.

The McKiernan-Terry Corp. of New York has adapted the Clayton unit to its McKiernan-Clayton steam generator, designed to generate steam for pile hammers.

Powering the various versions and adaptations of the Clayton generator are Kohler engines, built by the Kohler Co., Kohler, Wis.

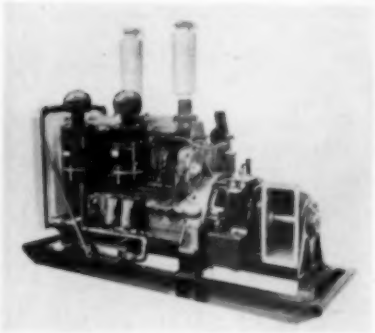
P & H Power Units

Manufacturer: Harnischfeger Corp., Diesel Engine Div., Crystal Lake, Ill.

Claims: The manufacturer has announced a line of diesel-engine torque-converter power units, built around its 2-cycle engine. The torque converter has its own fluid cooler. Various types of clutch arrangements are available. A tail-shaft governor is available. The unit

RENT INTERLOCKING STEEL SHEET PILING
'FASTER from FOSTER'
ALL LENGTHS & ALL SECTIONS TO MEET ALL YOUR JOB NEEDS
Foster's lower rental rates on all standard piling sections give you a low fixed expense as an added competitive advantage when bidding on jobs. RENT: Light-weight Corrugated Steel Sheet Piling—Pile Hammers and Extractors.
Send for: Piling Chart EE-8.
L.B. FOSTER CO.
PITTSBURGH 30 • NEW YORK 7 • CHICAGO 4
HOUSTON 2 • LOS ANGELES 5 • ATLANTA 8

"I know I told you to keep this road oiled regularly, but . . ."



is offered on P & H's complete line of diesels, from 30 to 255 horsepower.

Self-Righting Warning Torch

Manufacturer: Anthes Force Oiler Co., Fort Madison, Iowa.

Claims: A self-righting warning torch for night use has been introduced by the manufacturer. Called the Flame-Guard, the new torch features a square-type burner with an umbrella style hood that stays lit under adverse weather conditions. A cam-type coupling locks the burner to the body, but allows easy removal for filling. The 20-gauge steel

body is made in two halves which are double-seamed. The bottom is weighted for self-righting when tipped.

Using kerosene or light fuel oil, the torch has a burning time of 24 to 48 hours, depending on weather conditions. The body is finished in red baked enamel; the burner in aluminum baked enamel.

Air Tank Ejector Valve

Manufacturer: George Mfg. Co., Philadelphia, Pa.

Claims: The manufacturer announces an automatic ejector which clears waste materials from air tanks of all types of industrial air equipment. The ejector has only two moving parts and does not effect or interfere with equipment, claims George. It needs no supports or adjustments and uses no screens, diaphragms, washers or gaskets. Made of die-cast aluminum with molded nylon seats, the ejectors weigh 10 ounces and operates on pressure taken from the governor or unloaded line. Unloader pressure opens the valve and reservoir pressure closes the valve.

Loader Shock-Absorber

Manufacturer: Greer Hydraulics, Inc., Jamaica, N. Y.

Claims: The manufacturer is producing the Greer Accumulator, a hydraulic component designed to absorb bucket loader shock and vibration. The schematic illustration shows how the Greer Accumulator connects to main pressure line with pipe-T and hose between lift cylinders and control valve.

How to Get MORE Out of Your Dragline

A SAUERMAN Crescent Scraper may DOUBLE its Capacity

. . . . Any dragline can handle a Crescent Scraper of greater capacity than its regular bucket or clamshell. The Crescent is much lighter, size for size. It hauls its load on the ground, being lifted only when empty.

Larger machines can usually double their capacity with a scraper. Smaller units move about 50% more.

When the scraper is equipped with a carrier and is used with a track cable, machine range is limited only by the spooling capacity of the hoist drums. So equipped, it can reach farther, extend deeper under water or take material out of soft areas without the nuisance of mats.

To find out how much you can increase your dragline capacity, tell us the make, model number and boom length of your machine. We will then determine the largest scraper your crane can handle and give you our recommendations.

For more information, send for:

Field Report 228: How to Make a Boom Machine Reach Farther and Dig More; and Catalog J: Crescent Scraper Buckets.

SAUERMAN BROS. INC.

622 S. 28th Ave. | Bellwood, Ill.

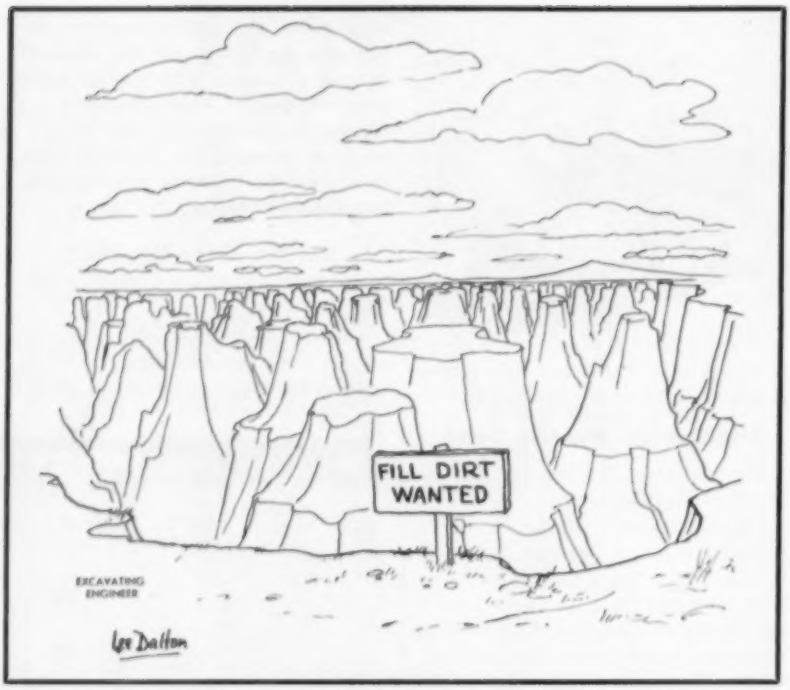
Stringfellow . . .

Continued from page 33

were restricted in places, chiefly because of past damage by heavy surf close to buildings. When sea wall construction reached one of these places, enough hauling trucks were pulled off the fleet for that day to compensate for the loss in ordinary placement production.

Placement of rock in the sea wall was unusually interesting because the timing of the work coincided largely with the period when the surf was worst. There were days when the placing crane worked while waves broke high over the sea wall, roaring furiously against the side of the crane's cab. At other times the sea was relatively calm, making faster work possible. Up to the time this article was written, rock-placing production never dropped much below 700 tons per day. A production rate of 1,000 tons per day generally was maintained.

The job originally was set up on a rush schedule of 80 working days, but Redondo Beach agreed to a negotiated time extension, so that a more leisurely construction phase could be set and money saved. In some respects, the money spent for the new sea wall does not necessarily represent money that is gone. Should the Army Corps of Engineers decide in the near future to lengthen or enlarge the Redondo Beach breakwater to provide additional protection for the coast line, the derrick stone undoubtedly would be purchased from the city and used in that construction. The blue granite chunks are practically indestructible.



Because of long over-the-road hauls, Stringfellow's truck drivers had a good common-sense agreement. Each driver assumed responsibility for the load immediately ahead. They almost never lost a big rock. The one time that did happen a truck crane was called immediately and the driver following stayed with it until the obstruction was cleared.

Personnel

The J. B. Stringfellow Co. operations are under the personal supervision of J. B. Stringfellow, Sr., who makes frequent trips between the quarries and various construction jobs which the firm bids. Other key officials include Stringfellow's son, J. B. Jr., and William Schmidt, who act as general superintendents and foremen at the various locations. Frank Watson and W. W. (Mac) McComber are two of Stringfellow's veteran shovel runners. Herb Hansen is in charge of all powder work.

Bucyrus-Erie power shovels are used exclusively for loading broken ore and overburden. There are two 150-Bs, each equipped with 5-yd. Esco dippers, a 120-B equipped with a 4½-yd. Esco dipper, and a 54-B with a 2½-yd. Bucyrus-Erie dipper. Hauling units include 18 Euclids and 3 Macks. Of these, 17 are 22-ton rigs, the balance are 15-ton machines. The hauling trucks are rotated around the shovels, to fit varying length of haul or other pit conditions. Three passes from the big dippers on the 150-Bs are sufficient to fill even the biggest trucks.

The latest addition to Eagle Mountain facilities is a new beneficiation plant, less than a year old. The purpose of the plant is to concentrate the ore, to some extent, by separating those particles which do not have a high iron content. Because of the new beneficiation plant, officials have estimated that approximately 20% less material now is being shipped by rail to Fontana to obtain the same amount of ore content as was obtained previously.

In passing through this plant, ore is dumped as it comes from the shovel dipper into one of the biggest jaw crushers in existence: a Birdsboro 66 x 84 primary. This big crusher reduces ore to 8-in.-minus material, after which it starts on its route through the concentrating plant. As the material passes through the plant, it goes through a 7-ft. Nordberg standard and a 7-ft.

Eagle BREAKER BALL DELIVERS THAT "SUNDAY PUNCH" FOR THE ALABASTER LIME CO.

ALABASTER, ALABAMA

The 3000 lb. breaker ball shown readily breaks high calcium limestone to 2½" x 40" crusher size. Ask for Bulletin 252—describes breaker balls of Ni-Hard for toughest jobs and semi-steel for regular jobs—1500 to 8000 lbs. Easily replaced hook. Spherical drop balls in 4 sizes.

EAGLE IRON WORKS

264 HOLCOMB AVE., DES MOINES, IOWA

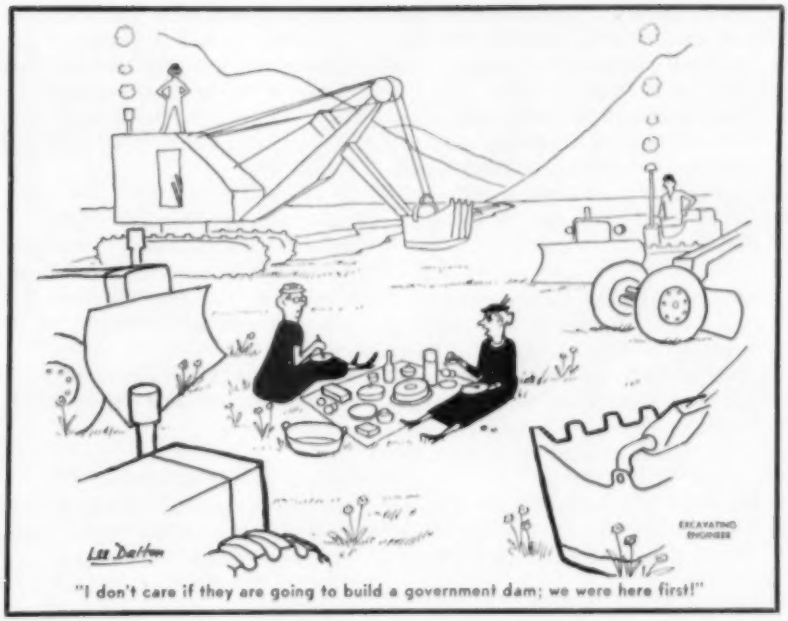
Steam Washers Log Washers Picker Loaders

Breaker Balls, Pile Hammers, and Line Weights.

Eagle . . .

Continued from page 39

equipped with Parkersburg hydra-tarders. Other trucks have the Allison torque converter and retarder. These devices save considerable wear on brakes by picking up and dissipating heat energy as the loaded units move downhill.



"I don't care if they are going to build a government dam; we were here first!"

Nordberg shorthead crusher, both of which are arranged in closed circuit with a set of Tyler screens. These reduce the material to 1½-in. minus in size. A second screening plant removes the minus 3/16-in. fraction, which then goes over dry magnetic separating drums which pick through the material. The concentrated iron ore from this part of the line goes to the concentrate pile, while rejects are stored for a possible further treatment when processes become available.

Magnetic Separator

The material greater than 3/16 inch in size passes through a magnetic separator, which routes the rejects through a heavy-media separator. Concentrated iron ore from this part of the process is sent by conveyor to shipping piles, and the final tailings, which are considered worthless for steel manufacturing, go out to a waste pile.

From the shipping pile the material moves to railroad cars, which are made up in trains behind the Eagle Mountain locomotives. Hauled 50 miles out to the main line, the cars eventually move over the Southern Pacific main line into the Fontana mill, where the ore passes through the blast furnaces on its route to strengthen the sinews of western industry.

Mining operations at Eagle Mountain are under the general supervision of R. G. Heers, manager of mines and of raw materials. Jim Hansen is manager of Eagle Mountain mine. He is assisted by Pete Leidich. The modernization of Eagle Mountain's open-pit operations has been of sufficient interest in western mining circles to make the difficult operation a model for all hard excavation jobs in that area.

Draglines . . .

Continued from page 42

locks between Grafton, Ill., and Lake Ontario.

On the trip to Chicago, a maintenance crew reconditioned the dragline. Additional rigging, to outfit the machines for the Seaway task, was added at the United States Engineers Dock near Chicago's Outer Drive.

The Badgett Seaway contract calls for the excavation of approximately 4 million cubic yards of rock and earth on the upper section of the Long Sault Canal and construction of dike embankments near Massena. The draglines will carve a channel 3 miles long, 442 ft. wide and 42 ft. deep.

While the Badgett draglines were in the early stages of their journey north, Canada opened its Seaway project May 16, when the first load of rock was dumped in an Athey PR21-Cat DW21 haul unit by a P & H shovel. The load — 22 cubic yards — was dumped on a dike between the Victoria and Jacques Cartier bridges near Montreal, Que.

The latter machines are owned by McNamara Pigott Peacock a Toronto, (Ont.) firm.

BUILT FOR THE JOB!
Omaha Dragline Buckets are built to do the job better, faster. All unnecessary weight has been eliminated. A higher arch gives more clearance for digging and dumping . . . makes room for a bigger load. Available in four types. Write today for complete catalog with description and specifications.
OMAHA
DRAGLINE BUCKETS
DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

New Trade Literature

Subject: **Cement Box**

Content: Specifications and construction data on the Dravo-Doyle Cem-Matic cement box are contained in a two-page bulletin. The Cem-Matic is an all-steel enclosed box which attaches to the partition gates on dump trucks used in hauling cement and aggregates to dual drum concrete mixers.

Where to get: Dravo-Doyle Co., Fifth and Liberty avenues, Pittsburgh, Pa.

Subject: **Bituminous Mixtures**

Content: Bulletin No. 105, published by the Highway Research Board of the National Academy of Sciences—National Research Council—discusses the fundamentals governing the design of bituminous paving mixtures. The essential properties required are defined and procedures are discussed for designing to meet these requirements. The uses and types of bituminous mixtures are related to some of their properties. Also discussed at length are the effects of variations in characteristics and gradations of aggregates and the effects of variation in bitumen content and characteristics of bitumen on the physical properties of mixtures. The price is 75 cents.

Where to get: Highway Research Correlation Service, Highway Research Board of the National Academy of Sciences—National Research Council, 2101 Constitution, Washington, D. C.

Subject: **Portable Compressor**

Content: An eight-page flier describes the 3R-36 cfm self-contained Spot-Air portable compressor and covers at length the tools it will operate. On-the-job illustrations are provided. The Spot-Air weighs 265 pounds. Request form 2302.

Where to get: Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or from Ingersoll-Rand branch offices.

Subject: **Safety Services Guide**

Content: Accident prevention aids available from the National Safety Council are catalogued in its 1955 Occupational Safety Services Guide. The 68-page guide provides a list of NSC periodicals, newsletters and a library of technical and administrative publications covering all phases of occupational accident prevention. A full line of posters, films and booklets are available to sell safety to the man on the job. Ask for Service Guide 2.1.

Where to get: National Safety Council, 425 N. Michigan ave., Chicago 11, Ill.

Subject: **I-H Booklet**

Content: A 30-page booklet, *What's New in International Crawler Tractors and Equipment*, lists recent improvements made in International TD-24, TD-18A, TD-14A, TD-9, T-9, TD-6 and T-6 crawlers. The new International TD-24 torque converter diesel crawler also is described. Pictures and lists of new International equipment are included, as is the International Drott line of skid-shovels for TD-18A, TD-14A, TD-9, T-9, TD-6 and T-6 crawlers.

Where to get: Consumer Relations Dept., International Harvester Co., 180 N. Michigan ave., Chicago 1, Ill.

Subject: **Sauerman Scrapers**

Content: The Sauerman method of increasing crane reach and load capacity through use of the firm's Crescent scraper are described in Field Report No. 228, issued by Sauerman Bros., Inc. The method is illustrated by a layout drawing. Included are three pages of on-the-job photographs.

Where to get: Sauerman Bros., Inc., Dept. E-23, 620 S. 28th ave., Bellwood, Ill.

Subject: **Caterpillar D9**

Content: Chief features of the Caterpillar D9 tractor are described in a four-page, illustrated booklet. Brief specifications are included. Ask for form 31555.

Where to get: Caterpillar Tractor Co., Peoria, Ill., or from Caterpillar distributors.

Subject: **Austin Loaders**

Content: A general catalog describes and illustrates each of the five Austin Overshot loader models—2-C, 4-C, 6-C, 7-C and 8-C. Contained in the catalog are action photos of each model, a large detailed view of a typical Austin loader, photographs of hydraulic system components, a schematic piping diagram, condensed specifications and principal dimensions. Available attachments are described and illustrated.

Where to get: Austin Div., Central Ohio Steel Products Co., Galion, Ohio, or 2 Santa Fe dr., Denver, Colo., or from Caterpillar dealers.

Subject: **Three-Wheel Rollers**

Content: A 20-page bulletin describes and illustrates the Huber-Warco line of standard and variable weight three-wheel rollers: the 8, 10, 12 and 14-ton standard models and the 8-10, 10-12 and 12-14-ton variable weight models. Included in the bulletin are cross-sections, diagrams and photographs of the equipment. A special section lists the road machinery background of both companies which now make up Huber-Warco. Ask for bulletin HWR-511.

Where to get: Huber-Warco Co., Marion, Ohio, or from Huber-Warco distributors.

Subject: **Tractor-Air Compressor**

Content: An eight-page bulletin describes Le Roi's new 125 Tractair, a tractor-air compressor unit. The brochure lists 21 of the machine's typical uses. A page is devoted to the power unit of the Tractair, a Le Roi D226 engine, which is joined in the same block with a 2-cylinder air compressor. Engine design, compressor fea-

In a Hayward, there's no contact between the closing mechanism and the gravel or other materials handled. To be sure—this "no contact" feature is only one advantage. But a very important one to you—since it means much less wear, reduced upkeep, and a significant dollar-saving in bucket maintenance.

The Hayward Company, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1880

tures and operating conveniences also are listed.

Where to get: Sales Promotion Dept., Le Roi Div., Westinghouse Air Brake Co., 1706 S. 68th st., Milwaukee 14, Wis.

Subject: **Highway Officials Directory**

Content: The American Road Builders' Association has ready its 1955 directory, *Highway Officials and Engineers*. The price is $1.

Where to get: American Road Builders' Association, World Center Building, Washington 6, D. C.

Subject: **Blasting Caps**

Content: A technical bulletin-catalogue of electric blasting caps, blasting aids and accessories covers instantaneous caps, split-second delay caps and regular delay caps for the coal, quarrying and road construction industries. Tables, drawings and photographs are used to discuss such general problems as electric detonation, modern blasting techniques, precision controls, specifications, rotation firing techniques, electric firing, resistance of circuit wires, simplified blasting circuits and blasting patterns.

Where to get: Explosives Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.

Subject: **Engineering Examinations**

Content: An enlarged, revised book, *California Civil Engineering Registration Examinations*, by August E. Waegemann, covers examinations given by California for the registration of civil engineers and engineers in training. The author's unofficial solutions are supplied for the examinations given between 1940 and July, 1949; examinations from July, 1949 to December, 1953 include only the problems. The book, containing 287 pages, is priced at $7, plus tax.

Where to get: August E. Waegemann, 2833 Webster st., San Francisco 23, Calif.

Subject: **Symons V-Screen**

Content: The Symons V-Screen is described in an eight-page bulletin. The screen is designed for fine screening, sizing, dewatering, dedusting, cleaning and washing. The bulletin describes how the new screening action of the machine multiplies its screening effect by combining centrifugal and gravitational forces for high capacity and sharp, single cut, wet or dry separations. Construction and operational details are given, as are dimensions of the screen and three types of collection hopper bases. The screen employs controlled diffused feed and vertical flow of material within a screening drum.

Where to get: Nordberg Mfg. Co., Milwaukee 1, Wis.

Subject: **Washing Plant**

Content: Described in an eight-page bulletin is the Pioneer 405-W scrubbing, washing and sizing plant. A two-page cutaway illustrates the flow of materials through the plant, which can turn out up to five sizes and oversize of gravel and sand. A page of drawings shows several possible modifications of the plant. Advantages of the washing plant are listed in the bulletin, which also contains a description of all units and gives specifications. Ask for bulletin No. 648.

Where to get: Pioneer Engineering Works, Inc., 1515 Central ave., Minneapolis 13, Minn., or from Pioneer distributors.

Subject: **Soil-Cement Stabilization**

Content: A 36-page brochure offered by the Pettibone Wood Mfg. Co., *The ABC's of Soil-Cement Stabilization*, details how soil-cement is being used in construction of roads, streets, airports and parking lots. The brochure defines soil-cement and covers the types of soil that can be used, how soil-cement stands up, how fast it can be laid, on what size jobs it can be used and how it is processed. The use of the Pettibone Wood Preparizer and Roadmixer in salvaging asphaltic materials from existing roads and shoulders and stabilizing them in cement is described. A separate section of the brochure describes how either native soils or imported materials are processed under maximum controlled conditions in three operations. Also included is a series of reference charts outlining tubular data on the proper use of soil-cement under varying conditions. Free copies of the brochure are available on requests written on business letterheads; the price to others is $1.

Where to get: Pettibone Wood Mfg. Co., 6900 Tujunga ave., North Hollywood, Calif.

Load 12 cubic yards per minute with an

AUSTIN OVERSHOT LOADER

Austin Overshot Loaders move material overhead, from loading point to haulage units, in one fast, straight-line movement. Because they waste no time twisting or turning, Austins complete each loading cycle in just 20 seconds—make 3 full cycles every working minute!

A Model 8-C Austin Loader, mounted on a Caterpillar D8 Tractor, moves 4 cubic yards of material every cycle—12 cubic yards each minute!

Austin Overshot Loaders are now available in five models, for installation on Caterpillar D2, D4, D6, D7 and D8 Tractors. Bucket capacities from 1 to 4 cubic yards.

Cut costs . . . boost your production . . . use Austins to load trucks, wagons, railcars—to mix or stockpile—to excavate.

AUSTIN DIVISION

Model 8-C Austin Overshot Loader loading rock in Colorado quarry

Central Ohio Steel Products Company Galion, Ohio • Denver, Colorado

Notes from the Manufacturers

Chain Belt Co., Milwaukee, Wis., has appointed the Pioneer Equipment Co. of Nevada Inc., P. O. Box 78, Reno, as an exclusive distributor for Rex construction machinery equipment in Nevada (except White Pine, Elko and Clark counties) and the California counties of Alpine, El Dorado, Placer, Nevada, Sierra, Plumas and Lassen.

Caterpillar Tractor Co., Peoria, Ill., recently held an exposition of its equipment — both current production and future models — for more than 500 distributors, auxiliary equipment manufacturers and field representatives. More than 100 press representatives were given a preview of the exposition and were given a tour of the Peoria plant. The dealers met at Peoria in two groups, domestic and export. Each remained one week. Also participating in the exposition were 12 manufacturing firms who build products used with Caterpillar machines.

Clark Equipment Co., Benton Harbor, Mich., has appointed the six following new dealers to sell and service its Michigan line of tractor shovels and excavator cranes: Stephens Equipment Co., 818 S. W. Ninth st., Des Moines, Iowa, for central Iowa; R. E. Common Equipment Co., 1515 S. Washington st., Peoria, Ill., for west-central Illinois; Machinery Outlet, Inc., 7333 S. Broadway st., Wichita, Kan., for central and western Kansas; Totem Equipment Co., 3706 Airport Way, Seattle, Wash., for Washington (except five southwest counties) and northern Idaho; West Virginia Tractor and Equipment Co., Charleston, W. Va., for West Virginia, with the exception of the counties of Marshall, Ohio, Brooke, Hancock, Morgan, Berkeley and Jefferson; and Barker Equipment Co., Fredericton, New Brunswick, for the province of New Brunswick.

Cleveland Trencher Co., Cleveland, Ohio, has promoted E. B. Volmar to vice president in charge of manufacturing and has appointed Clifford P. Morgan as sales manager and David L. Raymond as chief engineer. Volmar, works manager of the company for the last five years, also was elected to the board of directors.

Dart Truck Co., Kansas City, Mo., has a new president, George F. Dixon, Jr., who was elected to succeed Furber Marshall. A former non-resident president, Marshall becomes chairman of the board of directors. He is president of the Carlisle Corp., Carlisle, Pa., of which Dart is a subsidiary company. Dixon is a graduate of the United States Military Academy at West Point, N. Y. He received his master's degree from Cornell University and his doctor's degree as a Freeman fellow at the University of Grenoble.

Detroit Diesel Engine Division, General Motors Corp., Detroit, Mich., has appointed Charles W. Frederick as director of engineering and Clyde W. Truxell, Jr., as works manager. Frederick, an assistant chief engineer of the GM Chevrolet Division since 1952, replaces Laurence S. Sheldrick, who was named technical assistant to the general manager. Truxell, director of engineering and manufacturing for Allison Division's Aeroproducts operations since 1953, replaces Albert F. Davis, who became director of engineering and manufacturing at GM's diesel equipment division in Grand Rapids, Mich. Frederick has been with General Motors since 1923; Truxell since 1932. Detroit Diesel also has named Royce A. Hill as manager of Florida Diesel Engine Sales, the division's branch covering most of Florida. Hill's headquarters will be in Miami. A branch will be maintained in Jacksonville.

L. B. Foster Co., New York, N. Y., has established a new office in Atlanta, Ga. The office will serve Alabama, Florida, Georgia, North Carolina, South Carolina and Tennessee.

Continued on page 78

STURDILITE
Heavy-Duty
FLOOD LAMPS
For Better Light • Longer Service • Lower Cost
Especially Designed for Efficient Service on
Shovels • Excavators • Drag-Lines • Roadbuilding Equipment
Locomotive Cranes • Tractors . . .
Metal Spinning Division
PHOENIX PRODUCTS CO.
4723 N. 27TH ST. • MILWAUKEE 16, WIS.
Available in 6-8, 12-16, 24-28, and 110-120 voltages.
Rubber Mounted Base Standard Model
Write for Illustrated Bulletin.

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—15th of preceding month. Example: January closes December 15th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Bucyrus-Erie model 150-B Ward Leonard electric shovel, pushbutton starting, separately driven exciter, Tri-Ten dipper handle, available with six cubic yard rock dipper or special seven cubic yard dipper; serial no. 101329; shipped August 1953; excellent condition; location: South Dakota. Box 3598

Used P&H 1055 diesel-powered shovel, 3½ yard dipper, in good operating condition, approximately 4 years old; ample supply of parts; will consider attractive price for machine with minimum amount of spare parts or reasonable price on machine and entire inventory of parts; for inspection and demonstration, contact: Box 3669

Two Marion 480 electric shovels for power supply three phase 60 cycle 2300 volts located in the South, fair operating condition, also large inventory of unused spare parts, reasonable. For further information, contact: Box 3666

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Osgood 1¼ yard heavy duty clam shell without bucket, shop no. 2240, 45' boom; can be seen in operation; price: $3000 f.o.b. our plant. South Bend Sand & Gravel Corp., 3113 Lincoln Way West, South Bend 28, Indiana.

38-B Bucyrus-Erie shovel, clamshell and dragline, diesel engine, serial no. 52887; new June 1947.
38-B Bucyrus-Erie clamshell and dragline, diesel engine, serial no. 100497; new November 1952.
22-B Bucyrus-Erie dragshovel, shovel, clamshell and dragline, diesel engine, serial no. 71131; new January 1949.
22-B Bucyrus-Erie dragshovel, shovel, clamshell and dragline, diesel engine, serial no. 83010, new November 1950. Earth Movers, Inc., 2493 East 20 Street, Cleveland 15, Ohio.

Practically new Lorain model TL-25-5 size ¾ yd. dragshovel with G-M diesel used less than six months; bargain price. Stuart M. Christhilf & Co., Inc., 134-136 West Mt. Royal Avenue, Baltimore 1, Md.

WILL SACRIFICE

LIMA 44 1 C.Y. Complete with Backhoe Attachment and Bucket and 1 extra 1 C.Y. Shovel Bucket —Serial #330066 for $18,500. Purchased March, 1954 at a cost of $27,500—Used only 6 months.

MOSEMAN CONSTRUCTION CO., INC.
2311 N. Front St. Harrisburg, Pa.

Michigan TM-16 crane, 60' boom, mounted on heavy duty Mack with screw-type outriggers; good condition; ready to go to work; $8500 Atlanta. R. S. Armstrong & Bro. Co., 676 Marietta Street, N.W., Atlanta, Georgia.

MISCELLANEOUS EQUIPMENT

Used 10-B backhoe attachment. Three 10-B standard ¾ yd. shovel fronts; twin rope crowd. New 15-B standard ½ yd. shovel front. Used 15-B standard ½ yd. shovel front; excellent condition. 38-B standard 1½ yd. shovel attachment like new; original teeth. Used 40' boom for Lorain 41 complete with Rudomatic tagline fairlead and dragline lagging. R. S. Armstrong & Bro. Co., 676 Marietta St. N.W., Atlanta, Georgia.

Locomotives, 5 to 80 tons, diesel, gas.
Monighan Walker dragls., 9, 7, 5W, 200W.
Cranes, draglines, shovels, 1½ to 25 yds.
Dredges: 6", 12", 16" placer; 12" hydr.
Locomotive cranes, 25-40 tons, diesel (7).
International batch trucks (25), 34-E.
Diesel marine engines, 390 to 1600 HP.
G.M. diesel-elec. generator plant, 3000 KW.

H. Y. SMITH COMPANY
828 North Broadway Milwaukee 2, Wis.

Six cubic yard dipper and Tri-Ten handle for Bucyrus-Erie 150-B Shovel; slightly used but in excellent condition. Box 3588

A quantity of used Bucyrus-Erie blast hole drills model 42-T for 9" and 12" holes; both electric and diesel power; located in Pennsylvania. Box 3674

1943 Loomis blast hole drill mounted on 13' cats equipped with 33' derrick and Continental engine; various tools also included; excellent condition, price: $1500. John Sharamanda, North Lions St., Lansdale, Pa.

New 18" dredging pump, rectangular cross section casing, high alloy steel liners, high alloy cast steel 4 vane runner; spare liners. Box 3587

Bucyrus-Erie 22-T blast hole drill; purchased new 1952; 34 ft. 6 in. one-piece derrick; gasoline engine driven with electric starter; 22-W bull reel; perfect condition.
Loomis Clipper #44, crawler mounted, gasoline engine driven; both machines immediately available. Kermit Snyder, Deer Lake, Pine Blvd., Orwigsburg, Pa., Phone: Orwigsburg 6-8221.

Backhoe boom for 22-B; straight type; never used; considerable saving. Beasley-Holmes Company, 3020 Reynolds Road, Toledo, Ohio, Phone: Fr. 1494.

POSITION WANTED

Superintendent available. 30 years experience and qualifications covering hi-ways, airports, large sewers, water lines, heavy and light excavating; all types; know cost and modern equipment; sober, honest, and reliable; middle West or West. Box 3593

HELP WANTED

Wanted: Contractor with portable hydraulic dredge to move 1,500,000 c.y. location: North-ern Illinois area. Box 3673

If you are Buying or Selling Used Equipment this is the place to let the Excavating Industry know about it.

Notes . . .

Continued from page 76

Paul A. Duke, a graduate engineer of Georgia Tech who formerly was associated with the Atlantic Steel Co., will head the new office. Foster is a major supplier of pipe, steel, sheet piling and railroad trackage materials.

General Electric Co., Welding Dept., York, Pa., has appointed the Brady Supply Corp., 255-259 State st., Elmira, N. Y., as an area distributor for its welding products. Its territory includes the counties of Chemung, Schuyler and Steuben in New York and Bradford and Tioga in Pennsylvania. The Welding Dept. also has established a new direct-sales office and warehouse in Buffalo, N. Y., at 701 Seneca st. W. C. Leaman, Buffalo metallurgist and welding engineer, has been named manager of the new office.

Heil Co., Milwaukee, Wis., has appointed Teco, Inc., Box 1484, Fannin rd., Jackson, Miss., as a distributor of its truck equipment in southeastern Mississippi.

Huber-Warco Co., Marion, Ohio, has appointed two distributors of its complete line of tandem and three-wheel rollers and graders. They are the Foulger Equipment Co., 1361 South Second West, Salt Lake City, Utah, and Euclid-Arkansas, Inc., 702 W. Second st., North Little Rock, Ark.

Koehring Co., Milwaukee, Wis., has appointed M. O. Messenger as vice-president and general sales manager of Koehring-Waterous, Ltd., in Brantford, Ont. The Canadian firm was acquired by Koehring in 1953 as a wholly owned subsidiary. Messenger succeeds Donald M. Waterous, who resigned in 1954. Messenger has been associated with Koehring for more than 16 years.

Leschen Wire Rope Div., H. K. Porter Co., Inc., St. Louis, Mo., has appointed Robert M. Johnson as district sales representative in a territory embracing all of New England and eastern New York state. Since 1951 he had specialized in selling wire rope as branch manager of a supply company in the Pennsylvania oil fields. The Porter Co. has purchased the Vulcan Crucible Steel Co., of Aliquippa, Pa. It is Porter's 12th division.

LeTourneau-Westinghouse Co., Peoria, Ill., has named the Richmond Machinery & Equipment Co., Inc., 1701 Roseneath rd., Richmond, Va., as a distributor for its equipment, including motor graders and Trave-Loaders of its Adams division. Richmond Machinery will serve all but the following counties in Virginia: Frederick, Clarke, Louden, Fairfax, Prince Williams, Arlington, Northampton and Accomac. The firm has a branch at 3742 Campbell ave., Lynchburg, Va.

McDowell Co., Inc., Cleveland, Ohio, has appointed the H. Kleinhans Co., Pittsburgh, Pa., as its sales representative in western Pennsylvania. H. Kleinhans Co., will represent the following McDowell enterprises: Dwight-Lloyd Div.; Wellman Engineering Co.; and the Williams Bucket, Locomotive Crane and Anker-Holth divisions of Wellman. H. Kleinhans Co. maintains a branch office in Buffalo, N. Y.

Pettibone Mulliken Corp., Chicago, Ill., has elected Herbert J. Knudten as vice-president. Knudten is president of Universal Engineering Co., Cedar Rapids, Iowa, a subsidiary of Pettibone.

Pioneer Engineering Works, Inc., Minneapolis, Minn., has appointed the Butler Machinery Co., 610 13th st. N., Fargo, N. D., and Highway 81 South, Grand Forks, N. D., as a distributor of its Continuflo line of equipment.

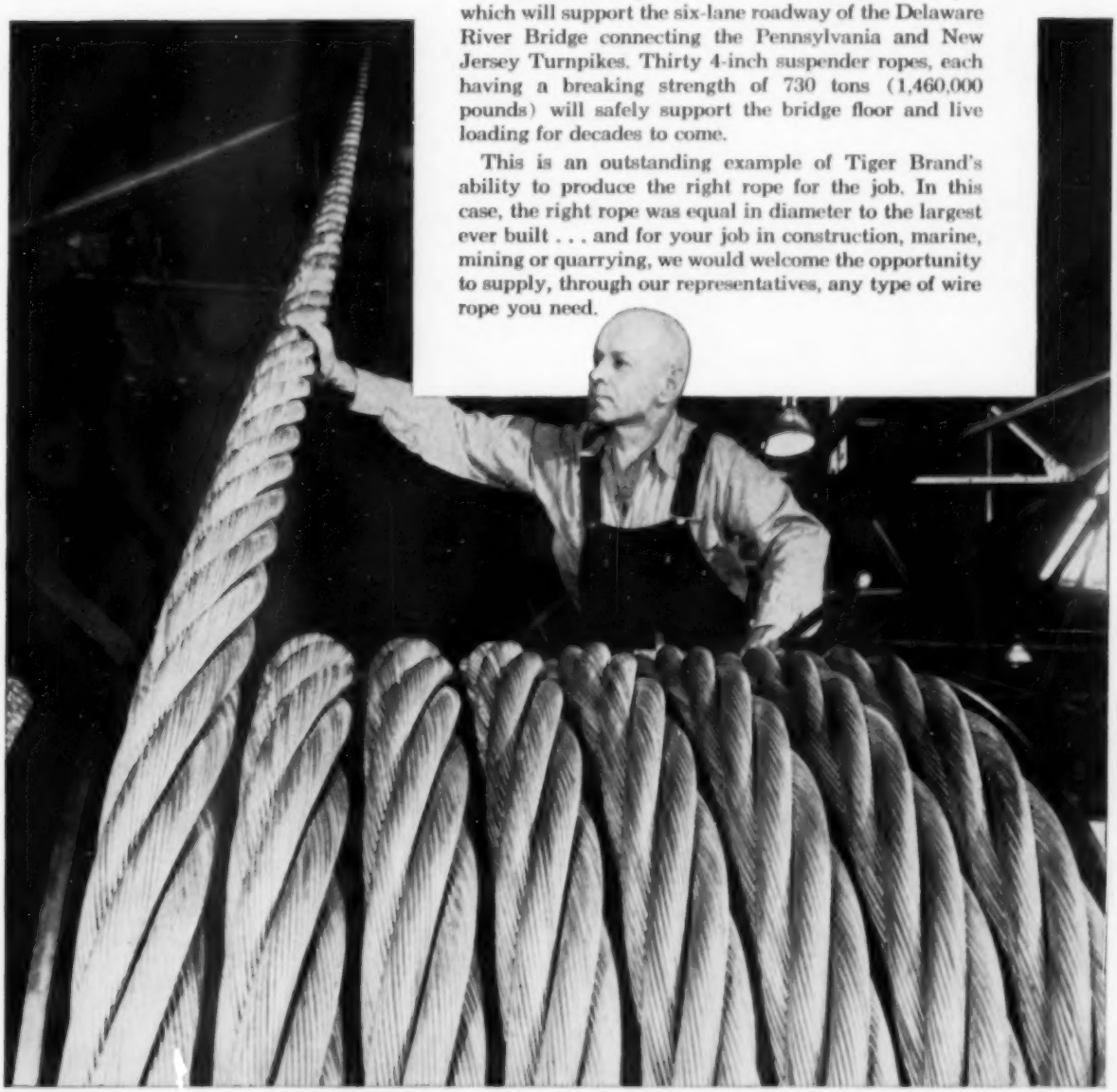
Sherman Products Inc., Royal Oak, Mich., has appointed Albert E. Manofsky as chief engineer. He formerly served as director of machine and tool designing for the E. A. Thompson Mfg. Co., Ferndale, Mich.; as a machine designer at Steller Engineering, Inc., Detroit, Mich., and as senior designer for the National Electric Welding Co., Bay City, Mich.

"Have you explained to mother how your piledriver works, dear?"

GIANT SUSPENDERS

In The Making

for the Pennsylvania-New Jersey Turnpike Bridge



You are witnessing the "birth" of the huge steel ropes which will support the six-lane roadway of the Delaware River Bridge connecting the Pennsylvania and New Jersey Turnpikes. Thirty 4-inch suspender ropes, each having a breaking strength of 730 tons (1,460,000 pounds) will safely support the bridge floor and live loading for decades to come.

This is an outstanding example of Tiger Brand's ability to produce the right rope for the job. In this case, the right rope was equal in diameter to the largest ever built . . . and for your job in construction, marine, mining or quarrying, we would welcome the opportunity to supply, through our representatives, any type of wire rope you need.

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

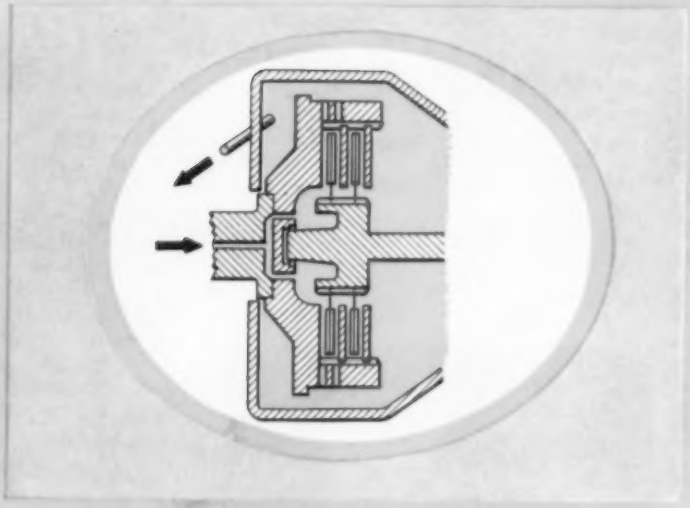
USS AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

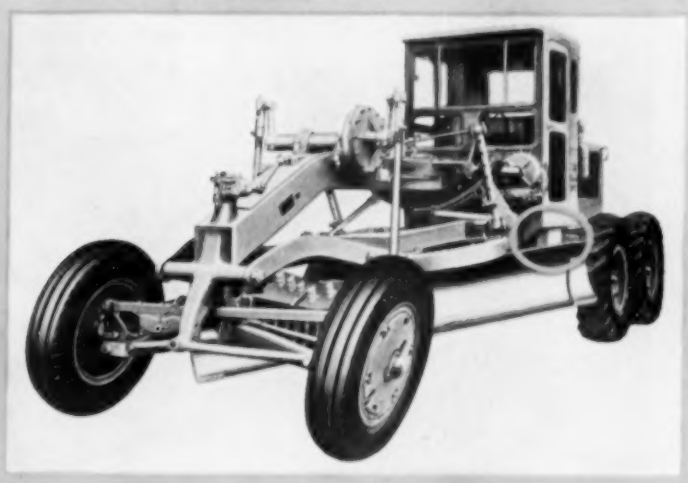
UNITED STATES STEEL

CATERPILLAR ANNOUNCES ANOTHER "FIRST":

NEW OIL CLUTCH for the NO. 12 MOTOR GRADER



Arrows show path of oil through housing with clutch disengaged. Facings remain cool and bathed in oil, which is carried to outlet at top by flywheel ring gear. The two steel clutch discs and clutch brake are faced with pressure-processed cork, which gives an excellent coefficiency of friction and long wear.



The new oil clutch for the No. 12 Motor Grader gives you the same reliability and improved performance as the thoroughly job-proved oil clutch in Caterpillar track-type Tractors. Rugged and reliable, it uses oil from the engine lubrication system. Here are some of the things the new oil clutch for the CAT* No. 12 can mean to *you:*

LONGER WORK LIFE—In actual on-the-job tests, clutch facings wear less than the thickness of a human hair in one thousand hours' operation! Thick clutch facings mean that work life is extended thousands of hours before discs need be replaced. And constant "oil bath" lubrication reduces wear on all moving parts.

LESS MAINTENANCE—Adjustment every 1500 hours is not unusual, after initial "break in." This is equivalent to nearly nine months without adjustment on road maintenance work! No external lubrication is needed: internal oil system lubricates pilot and throwout bearings.

GREATER EFFICIENCY—The clutch is constantly cooled, never exceeding normal engine oil temperature. This practically eliminates clutch fade, greatly reduces slippage due to overheating, and means that the clutch retains "like new" operation for thousands of hours.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR*

*Cat and Caterpillar are Registered Trademarks of Caterpillar Tractor Co., U. S. A.

99% OF ALL CAT MOTOR GRADERS ARE STILL IN USE